Vista Chino (State Route 111) at Farrell Drive Street Improvement Project

Air Quality Report

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Palm Springs, California

District 8-RIV-SR 111-52401

CML 5282 (037)

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Executive Summary

Purpose of the Air Quality Report

The California Department of Transportation (Caltrans) in cooperation with the City of Palm Springs (City) and the County of Riverside (County) proposes to construct a new northbound dedicated right-turn lane on Farrell Drive at Vista Chino (also known as State Route 111 [SR 111]) located within Riverside County in the City of Palm Springs. As part of the environmental review process under National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) requirements, an evaluation is required to assess air quality impacts from the project.

The project is located in Coachella Valley within the Salton Sea Air Basin (Basin) and under the local jurisdiction of the South Coast Air Quality Management District (SCAQMD). The Basin is designated as a maintenance and nonattainment area for three federal criteria pollutants which requires the project to meet Transportation Conformity requirements under the Clean Air Act (CAA) Amendments of 1990.

Pollutant emissions would primarily be generated during the construction and operation of the project. Therefore, this air quality report evaluated potential air quality impacts to determine whether or not the project will:

- exceed established construction emission thresholds of significance;
- cause a carbon monoxide or particulate matter hot spot;
- violate any ambient air quality standard, contribute substantially to an existing or projected violation or expose sensitive receptors to substantial pollution concentrations; or
- have a significant effect on the environment from a cumulative standpoint.

Build Alternative

The Build Alternative would construct a dedicated right-turn lane on Farrell Drive to Vista Chino (SR 111) that will allow northbound traffic turning right on to Vista Chino to avoid a long queue of vehicles waiting during the red phase of the signal cycle. The addition of the northbound right turn lane will require relocation of the existing stop from Farrell Drive to Vista Chino.

No-Build Alternative

The No Build Alternative would not provide any improvements to the Vista Chino and Farrell Drive intersection.

Federal, State, and Local Regulations

The U.S. Congress enacted the CAA in 1970 and its Amendments in 1977 and 1990. The CAA Amendments of 1990 comprise the primary legislation that governs federal air quality regulations. The CAA Amendments delegate primary responsibility for clean air to the U.S. Environmental Protection Agency (EPA). The EPA develops rules and regulations to preserve and improve air quality and delegates specific responsibilities to state and local agencies. Under the CAA, the EPA has established the National Ambient Air Quality Standards (NAAQS) for six potential air pollutants:

carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), suspended particulate matter (PM_{10} & $PM_{2.5}$), sulfur dioxide (SO_2), and lead (Pb).

The State of California has developed the California Ambient Air Quality Standards (CAAQS). The California Air Resources Board (CARB), which is part of the California EPA regulatory agency, develops air quality regulations at the state level. The CARB also is responsible for developing motor emissions standards for California vehicles. The state regulations mirror federal regulations by establishing industry-specific pollution controls for criteria, toxic, and nuisance pollutants. California also requires that plans and strategies for attaining CAAQS as set forth in the California Clean Air Act (CCAA) of 1988 be developed throughout the state. These standards are generally more stringent than the federal standards and include four additional pollutants sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particulates. The CCAA requires that each local air quality district develop an Air Quality Management Plan (AQMP) that is in compliance with the CAAQS.

The SCAQMD is the local agency responsible for ensuring that NAAQS and CAAQS are maintained for all of Orange County and the urban portions of Los Angeles, Riverside and San Bernardino counties. The Basin is currently designated as nonattainment for PM_{10} and O_3, as a attainment area for CO, and an unclassified area for $PM_{2.5}$.

Emissions Analysis

An air quality analysis was conducted to assess changes in air quality created by the operation of the project on the surrounding area. Potential air quality impacts from the operation of the project are primarily associated with the redistribution of vehicles to the additional right-turn lane. Impacts generated from the redistribution of traffic may include incremental changes to vehicle miles traveled (VMT) and average daily traffic (ADT) along SR 111. Changes in these traffic patterns along the highway could potentially change the overall concentrations of pollutant levels from vehicle exhaust emissions throughout the project area. Operation related emissions were assessed on a regional and project-level.

Regional Analysis

The project will involve intersection channelization and qualified as a conformity exemption as listed in 40 CFR 93.127, Table 3, and is exempt from requirements to determine regional conformity.

Project-Level Analysis

The additional right-turn lane at the intersection of Vista Chino (SR 111) and Farrell Drive will relieve traffic congestion and delay time at the local intersection and will improve circulation to accommodate future traffic increases. These project improvements are considered to provide a minimal impact to air quality in the surrounding area. The pollutants of concern when analyzing transportation project-level impacts are CO, PM_{10}, and $PM_{2.5}$ as these pollutants have a tendency to accumulate around intersections with heavy traffic congestion where vehicles are traveling at slower speeds.

Carbon Monoxide (CO) Analysis

Caltrans, in coordination with the University of California, Davis, Institute of Transportation Studies, has developed a transportation project-level CO Protocol (December 1997). This CO Protocol details a qualitative step-by-step screening procedure to determine if project-related CO concentrations have a potential to generate new air quality violations, worsen existing violations, or delay attainment of NAAQS for CO. If the screening procedure reveals that such a potential may exist, then the CO Protocol details a quantitative method to ascertain project-related CO impacts.

Caltrans' CO protocol-screening procedure demonstrated that the project would not have a significant effect on localized CO concentrations. Implementation of the project would not result in higher CO concentrations than those existing within the region at the time of attainment demonstration, on the basis of protocol analysis methodology, no further analysis is needed and no minimization measures are necessary.

Particulate Matter (PM) Analysis

Upon reviewing preliminary traffic data, it was determined that the AADT information received does not classify the project as a project of air quality concern. The highest AADT volumes for future build conditions is on the Vista Chino segment, the volumes shown for this segment are well below 140,000 to 150,000 AADT. No segment along the roadway has an average AADT over 150,000. The traffic data supports characterizing the project as a new or expanded highway project that primarily services gasoline vehicle traffic (i.e., does not involve a significant number or increase in the number of diesel vehicles) and involves congested intersections operating at LOS D, E, or F.

Mobile Source Air Toxics (MSATs)

Upon review of the build alternative and the FHWA guidance categories, the project is classified as a minor widening project. The AADT collected for the project is below 150,000, indicating that the project will not be a project of air quality concern to the surrounding area.

Further, emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce annual MSAT emissions by 72 percent between 1999 and 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

Climate Change

A quantitative analysis estimating CO_2 emissions for existing, 2012, and 2035 conditions was performed using Caltrans' CT-EMFAC. Inputs used to estimate CO_2 emissions were peak and off peak total VMT, vehicle mix, and VMT distribution by speed. CO_2 emissions are expected to increase from existing conditions to 2035 conditions due to increases in total VMT. Furthermore, CO_2 concentrations are expected to remain the same for no build and conditions due to the similar VMT between the two alternatives. The additional right-turn lane is not expected to create an increase in VMT to the intersection, therefore, the project is not expected to cause a significant impact to the surrounding area.

Ozone

The SCAQMD has established thresholds of significance for O_3 precursors for the operation of transportation projects, 55 pound per day for ROGs and 55 pounds per day for NO_x emissions. The operation of the project will have a minimal impact on the Basin with the implementation control measures incorporated from the plans and programs developed by the SCAQMD. Further, the project was incorporated in the conforming FTIP.

Therefore, it is anticipated that the project would not worsen existing air quality, or cause an exceedance, or cause any new violations of the O_3 standards. Regional transportation conformity requirements are satisfied through the inclusion of the project in the conforming FTIP.

Odors

The operation of the project will not be a significant source of offensive orders. Any odors generated from the corridor after implementation of the project will be similar in nature to odors that would be generated from the corridor in the absence of the project. A site visit determined that there were no unusual or objectionable odors detected from nearby on-site or off-site land uses. Therefore, the project is not anticipated to cause or substantially contribute to odor impacts.

Cumulative Impacts

Operational emissions associated with the project are not expected to increase emissions from mobile sources and would provide an air quality benefit in the Basin. Furthermore, implementation of the project, along with other projects included in the regional RTP and Interim FTIP, should further improve traffic flow and decrease congestion within the region.

Construction

Project construction would result in temporary air pollutant emissions of CO, NO_x, ROG, and PM_{10}. It is assumed that stationary or mobile powered on-site construction equipment will include trucks, tractors, signal boards, excavators, backhoes, concrete saws, crushing and/or processing equipment, graders, trenchers, pavers and other paving equipment. Based on the insignificant amount of daily work trips required for project construction, construction worker trips are not anticipated to significantly contribute to or affect traffic flow on local roadways and are therefore not considered significant. During the demolition phase some asphalt concrete (AC) pavement and curbs and gutters would have to be removed.

In order to further minimize construction-related emissions, all construction vehicles and construction equipment would be required to be equipped with the state-mandated emission control devices pursuant to state emission regulations and standard construction practices. After construction of the project is complete, all construction-related impacts would cease, thus resulting in a less than significant impact. Short-term construction PM_{10} emissions would be further reduced with the implementation of required dust suppression measures outlined within SCAQMD Rule 403. The Caltrans Standard Specifications for construction (Section 10 and 18 [Dust Control] and Section 39-3.06 [Asphalt Concrete Plants]) are required to be a part of all construction contracts.

Mitigation

After a detailed analysis, it has been determined that air quality impacts created from the construction and operation of the project will be minimal, thus no mitigation measures are required. However, it is recommended that Best Available Control Measures (BACM) be implemented to minimize the emissions of PM_{10} and $PM_{2.5}$ during construction as a preventative measure.

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List of Abbreviated Terms

AB 32	Assembly Bill 32
AADT	average annual daily traffic
ADT	average daily traffic
AQMP	Air Quality Management Plan
BACM	Best Available Control Measures
Basin	Salton Sea Air Basin
CAAQS	California Ambient Air Quality Standards
Caltrans	California Department of Transportation
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CASAC	Clean Air Scientific Advisory Committee
CCAA	California Clean Air Act
CCAP	Climate Change Action Plan
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CH_4	methane
City	City of Palm Springs
CAA	Clean Air Act
CO	carbon monoxide
CO_2	carbon dioxide
County	County of Riverside
DE	Diesel exhaust
EIRs	Environmental impact reports
EPA	U.S. Environmental Protection Agency
FHWA	Federal Highway Administration
FTIP	Federal Transportation Improvement Program
GCC	greenhouse climate change
GHG	Greenhouse gas
HFCs	hydrofluorocarbons
HFE	hydrofluorinated ethers
IPCC	Intergovernmental Panel on Climate Change
IRIS	Integrated Risk Information System
ISR	Indirect Source Review
LOS	level-of-service
MPO	Metropolitan Planning Organization
MSATs	mobile source air toxics
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NATA	National Air Toxics Assessment
NEPA	National Environmental Policy Act
NESCAUM	Northeast States for Coordinated Air Use Management

List of Abbreviated Terms

NF_3	nitrogen trifluoride
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
O_3	ozone
Pb	lead
PFCs	perfluorocarbons
PM_{10}	particulate matter 10 microns or less in diameter
$PM_{2.5}$	particulate matter 2.5 microns or less in diameter
POAQCs	projects of air quality concern
ROGs	Reactive Organic Gases
RTIP	Regional Transportation Improvement Program
RTP	Regional Transportation Plan
SAFETEA	Safe, Accountable, Flexible, Efficient Transportation Equity Act
SAFETEA-LU	Safe, Accountable, Flexible, Efficient, Transportation Equity Act: A Legacy for Users
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SF_6	sulfur hexafluoride
SIP	State Implementation Plan
SO_2	sulfur dioxide
SR	State Route
UNFCCC	United Nations Framework Convention on Climate Change
VMT	vehicle miles traveled

Chapter 1. Introduction

The California Department of Transportation (Caltrans) in cooperation with the City of Palm Springs (City) and the County of Riverside (County) proposes to construct a new northbound dedicated right-turn lane on Farrell Drive at Vista Chino (also known as State Route 111 [SR 111]) located within Riverside County in the City of Palm Springs. This project is made possible by the Congestion Mitigation and Air Quality (CMAQ) federal aid program funding being coordinated through Caltrans. As part of the environmental review process under National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) requirements, an evaluation is required to assess air quality impacts from the project.

The project is located in Coachella Valley within the Salton Sea Air Basin (Basin) and under the local jurisdiction of the South Coast Air Quality Management District (SCAQMD). The Basin is designated as a maintenance and nonattainment area for three federal criteria pollutants which requires the project to meet Transportation Conformity requirements under the Clean Air Act (CAA) Amendments of 1990, and the recent revisions by the Safe, Accountable, Flexible, Efficient Transportation Equity Act (SAFETEA) (August 10, 2005), and the Federal Regulations 40 CFR (Code of Federal Regulations) Part 93. This air quality report will provide information to determine whether a conformity determination can be made on a regional and project-level basis to satisfy these requirements.

Pollutant emissions would primarily be generated during the construction and operation of the project. Therefore, this air quality report will evaluate potential air quality impacts to determine whether or not the project will:

- exceed established construction emission thresholds of significance;
- cause a carbon monoxide or particulate matter hot spot;
- violate any ambient air quality standard, contribute substantially to an existing or projected violation or expose sensitive receptors to substantial pollution concentrations; or
- have a significant effect on the environment from a cumulative standpoint.

The results of the air quality report will provide information to determine whether a conformity determination can be made on a regional and project-level basis.

Chapter 2. Project Location, Description, and Alternatives

The California Department of Transportation (Caltrans), in cooperation with the City of Palm Springs and the County of Riverside, proposes to improve the intersection of Vista Chino (SR 111) and Farrell Drive, shown in Figure 1. The project area is located within Riverside County and the City of Palm Springs. One Build Alternative and the No Build Alternative have been evaluated.

2.1. Project Location

The City of Palm Springs is located in the westerly end of the Coachella Valley within the Agua Caliente Indian Reservation. Figure 1 shows the regional location of the City of Palm Springs. The project site is located at the southeast corner of the intersection of Vista Chino (State Route 111) and Farrell Drive (see Figure 2, Project Location Map). The project site location is further defined as being within Section 12, Township 4 South and Range 4 East on the Palm Springs 1996 USGS quadrangle map; at latitude 33° 50’ 41” North and longitude 116° 31’ 09” West.

Photographs of the project site and vicinity show that the project site is complete developed and impacted by existing improvements and use. The project site is adjacent to the Palm Springs International Airport, with existing landscaping planted between the street improvements and Airport perimeter.

2.2. Purpose and Need for the Project

2.2.1. Purpose

The purpose of this project is to reduce traffic congestion at the intersection of Vista Chino (State Route 111) and Farrell Drive which currently has a high volume of northbound right-turn vehicle trips (318 vehicles in the PM peak hour). Construction of a dedicated northbound right-turn lane is warranted based on existing and future estimated vehicle trips. Vista Chino is one of three east-west major arterials on the City of Palm Springs General Plan, and Farrell Drive functions as a secondary thoroughfare. The purpose of this project is limited to addressing the northbound right-turn movement of this intersection; reducing congestion by making improvements unrelated to the northbound right-turn lane is not within the scope of this project.

2.2.2. Need for the Project

This project will reduce traffic congestion at the intersection of Vista Chino (State Route 111) and Farrell Drive by providing a dedicated northbound right-turn lane from Farrell Drive to Vista Chino (State Route 111). Currently, the Vista Chino/Farrell Drive intersection is configured with two through lanes and one left-turn lane for northbound traffic. A high volume of northbound traffic turns east (right) onto Vista Chino at the intersection, especially during peak hours. Through traffic waiting at the intersection in the right hand through lane frequently delay long queues of traffic waiting to turn right onto Vista Chino. The construction of a northbound dedicated right-turn lane will allow eastbound traffic to avoid a long queue of vehicles waiting to proceed through the intersection that are waiting for the traffic signal.

This project is made possible by funding through the Congestion Mitigation and Air Quality (CMAQ) federal aid program provided through the Safe, Accountable, Flexible and Efficient Transportation Equity Act – A Legacy for Users (SAFETEA-LU).

2.3. Project Description

This project includes removal of existing street improvements along the east side of Farrell Drive extending approximately 400 feet south of Vista Chino; construction of a new dedicated northbound right turn lane; removal of existing street and parkway landscaping improvements on the south side of Vista Chino (State Route 111) extending approximately 300 feet east of Farrell Drive to facilitate relocation of an existing bus stop / turnout from within the proposed right-turn lane on Farrell Drive to the south side of Vista Chino immediately east of the intersection; and relocation of traffic signal poles and equipment at the southeast corner of the Vista Chino / Farrell Drive intersection, including necessary upgrade of the existing traffic signal system with excavation limited to jack/bore method and/or trenching 30” below existing grade for new traffic signal conduit (4” diameter or less) within the intersection. Removal and replacement of existing curb ramps at all four corners will be completed to conform to current ADA standards.

2.3.1. No-Build Alternative

The No Build Alternative would not provide any improvements to the Vista Chino and Farrell Drive intersection.

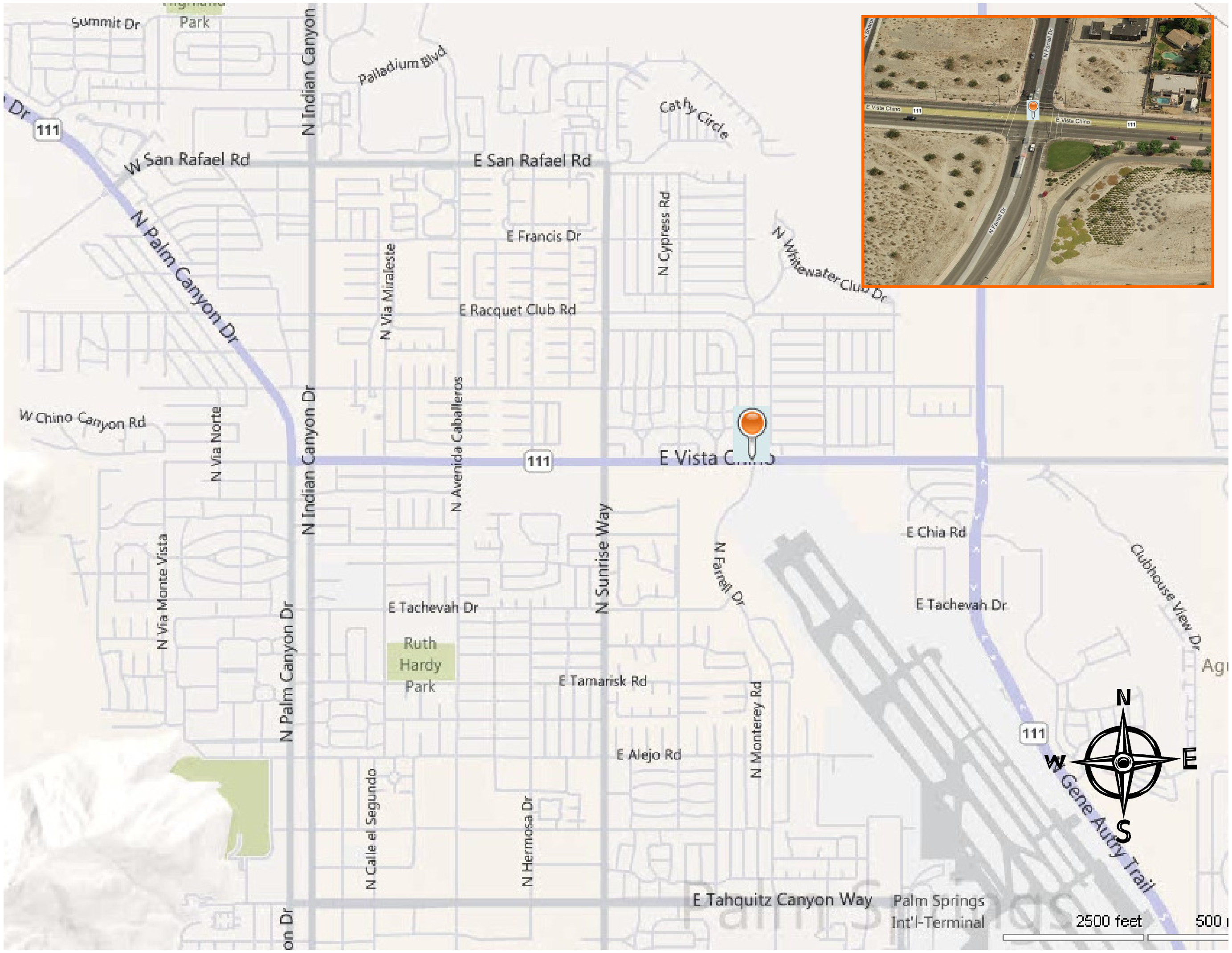

Figure 1. Project Vicinity Map

Figure 2. Project Location Map

Chapter 3. Federal, State, and Local Regulations

3.1. Federal Regulations

The U.S. Congress enacted the CAA in 1970 and its Amendments in 1977 and 1990. The CAA Amendments of 1990 comprise the primary legislation that governs federal air quality regulations. The CAA Amendments delegate primary responsibility for clean air to the U.S. Environmental Protection Agency (EPA). The EPA develops rules and regulations to preserve and improve air quality and delegates specific responsibilities to state and local agencies. Under the CAA, the EPA has established the National Ambient Air Quality Standards (NAAQS) for six potential air pollutants: carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), suspended particulate matter (PM_{10} & $PM_{2.5}$), sulfur dioxide (SO_2), and lead (Pb).

The EPA developed two maximum ambient thresholds in the NAAQS to protect human health and to prevent the further deterioration of the environment. Primary standards were developed to set limits to protect public health, including members of the public who are particularly sensitive to air quality pollution, such as children, the elderly, and those that suffer from chronic lung and respiratory conditions. Secondary standards were set to protect the surrounding environment, animals, crops, vegetation, and buildings.

The CAA Amendments of 1977 require that each state develop and maintain a State Implementation Plan (SIP) for each criteria pollutant that is in nonattainment of the federal NAAQS. A SIP consists of rules, technical documentation and agreements that an individual state will use to avoid and minimize emissions of pollutants that are in nonattainment of the NAAQS.

3.2. State Regulations

The State of California has developed the California Ambient Air Quality Standards (CAAQS). The California Air Resources Board (CARB), which is part of the California EPA regulatory agency, develops air quality regulations at the state level. The CARB also is responsible for developing motor emissions standards for California vehicles. The state regulations mirror federal regulations by establishing industry-specific pollution controls for criteria, toxic, and nuisance pollutants. California also requires that plans and strategies for attaining CAAQS as set forth in the California Clean Air Act (CCAA) of 1988 be developed throughout the state. These standards are generally more stringent than the federal standards and include four additional pollutants -- sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particulates. The CCAA requires that each local air quality district develop an Air Quality Management Plan (AQMP) that is in compliance with the CAAQS.

3.3. Local Regulations

The SCAQMD is the local agency responsible for ensuring that NAAQS and CAAQS are maintained for all of Orange County and the urban portions of Los Angeles, Riverside and San Bernardino counties. The Basin is currently designated as nonattainment for PM_{10} and O_3, as an attainment area for CO, and an unclassified area for $PM_{2.5}$. An area is designated as a nonattainment area when a measured concentration of any one of the six criteria pollutants exceeds the NAAQS. An area remains a nonattainment area until concentrations are in compliance with the NAAQS. Only after measured concentrations have fallen below the NAAQS can the state apply for redesignation to attainment by submitting a ten year plan outlining the areas strategies for meeting and maintaining air quality standards that follow the CAA. The redesignated area will be referred to as an air quality maintenance area until the standard has been sustained for a period of at least ten years.

Every three years, the SCAQMD prepares an overall plan (AQMP) for the air quality improvement to be submitted for inclusion in the SIP. Each iteration of the plan is an update of the previous plan. The Final 2007 AQMP was adopted by the AQMD Governing Board on June 1, 2007. On September 27, 2007, the CARB Board adopted the 2007 South Coast Air Quality Management Plan as part of the SIP.

Coachella Valley PM_{10} Plans

On June 21, 2002, the AQMD adopted the 2002 Coachella Valley PM_{10} SIP. The 2002 SIP included a request for extension of the PM_{10} deadline and met all applicable federal CAA requirements, including a Most Stringent Measures analysis, control measures, and attainment demonstration. The EPA approved the 2002 SIP on April 18, 2003. At the time of adoption, the AQMD committed to revising with the 2002 SIP with the latest approved mobile source emissions estimates, planning assumptions and fugitive dust source emission estimates, when they became available.

The 2003 SIP updated those elements of the 2002 SIP; however, the control strategies and control measure commitments have not been revised and remain the same as in the 2002 SIP. The 2003 SIP contains updated emissions inventories, emission budgets, and attainment modeling. It requests that the EPA replace the approved transportation conformity budgets in the 2002 SIP with those in the 2003 SIP. The EPA approved these budgets on March 25, 2004 with an effective date of April 9, 2004.

South Coast Air Basin Ozone SIP

The SCAQMD Governing Board adopted the "1999 Amendment to the 1997 Ozone SIP Revision for the South Coast Air Basin" at its public hearing on December 10, 1999. The 1999 Amendment provides revisions to the ozone portion of the 1997 AQMP that was submitted to the EPA as a revision to the South Coast Air Basin portion of the 1994 California Ozone SIP. On January 12, 1999, the EPA proposed partial approval/disapproval of the 1997 Ozone SIP revisions citing concerns with the ozone control strategy provided in the 1997 AQMP. To address these concerns, the AQMD staff has prepared the 1999 Amendment.

The 1999 Amendment provides additional short-term stationary source control measures that implement portions of the 1997 Ozone SIP's long-term stationary source control measures. In addition, the Amendment revises the adoption and implementation schedule for the remaining 1997 Ozone SIP short-term stationary source control measures that AQMD is responsible to implement.

The 1999 Amendment addresses the EPA concerns relative to the adoption schedule for the 1997 Ozone SIP Revision short-term control measures and the increased reliance on long-term control measures.

The Southern California Council of Governments (SCAG) is the federally designated Metropolitan Planning Organization (MPO) in the region. Both the SCAQMD and SCAG are responsible for drafting plans and programs to improve air quality within the Basin; however, the SCAG is specifically responsible for transportation planning for six counties in southern California: Los Angeles, Orange, San Bernardino, Riverside, Ventura and Imperial. Further, the SCAG is the primary transportation facilitator in the county, responsible for determining priority projects, assuring money accepted for improving transportation has been properly utilized and performing air quality conformity analysis on transportation projects in the Federal Transportation Improvement Program (FTIP).

3.4. Threshold for Odor

Odors are considered to be one of the most noticeable forms of air pollution to the general public. Offensive odors rarely cause people physical harm, however, they can potentially cause agitation, anger, and concern to the public about the possibility of negative health effects, especially in residential neighborhoods. Any project with the potential to frequently expose the public to objectionable odors would be deemed to have an impact.

3.5. Cumulative Impacts

Local pollutant impacts are cumulatively significant when available data indicates that the combined concentrations from the project and other existing and planned projects exceed air quality standards. A qualitative assessment will be conducted on the cumulative impacts of the project in combination with other planned projects within the Basin. Any proposed project that would individually have an air quality impact shall be considered to have a cumulative air quality impact.

3.6. Mobile Source Air Toxics

In addition to the criteria pollutants, mobile source air toxics (MSATs) are another group of pollutants of concern in the Basin. Transportation projects with a high potential for MSAT effects are required to perform a project-level MSAT analysis. The CAA identified 188 air toxics, also known as hazardous air pollutants. The EPA has assessed this expansive list in their latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007) and identified a group of 93 compounds emitted from mobile sources that are listed in their Integrated Risk Information System (IRIS) (http://www.epa.gov/ncea/iris/index.html). In addition, EPA identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from their 1999 National Air Toxics Assessment (NATA) (http://www.epa.gov/ttn/atw/nata1999/). These are acrolein, benzene, 1,3-butadiene, diesel particulate matter plus diesel exhaust organic gases (diesel PM), formaldehyde, naphthalene, and polycyclic organic matter. These seven pollutants have been considered the priority transportation-related air toxics.

The 2007 EPA rule mentioned above requires controls that will dramatically decrease MSAT emissions through cleaner fuels and cleaner engines. According to an FHWA analysis using EPA's MOBILE6.2 model, even if vehicle activity (vehicle-miles travelled, VMT) increases by 145 percent as assumed, a combined reduction of 72 percent in the total annual emission rate for the priority MSAT is projected from 1999 to 2050, as shown in Figure 3.

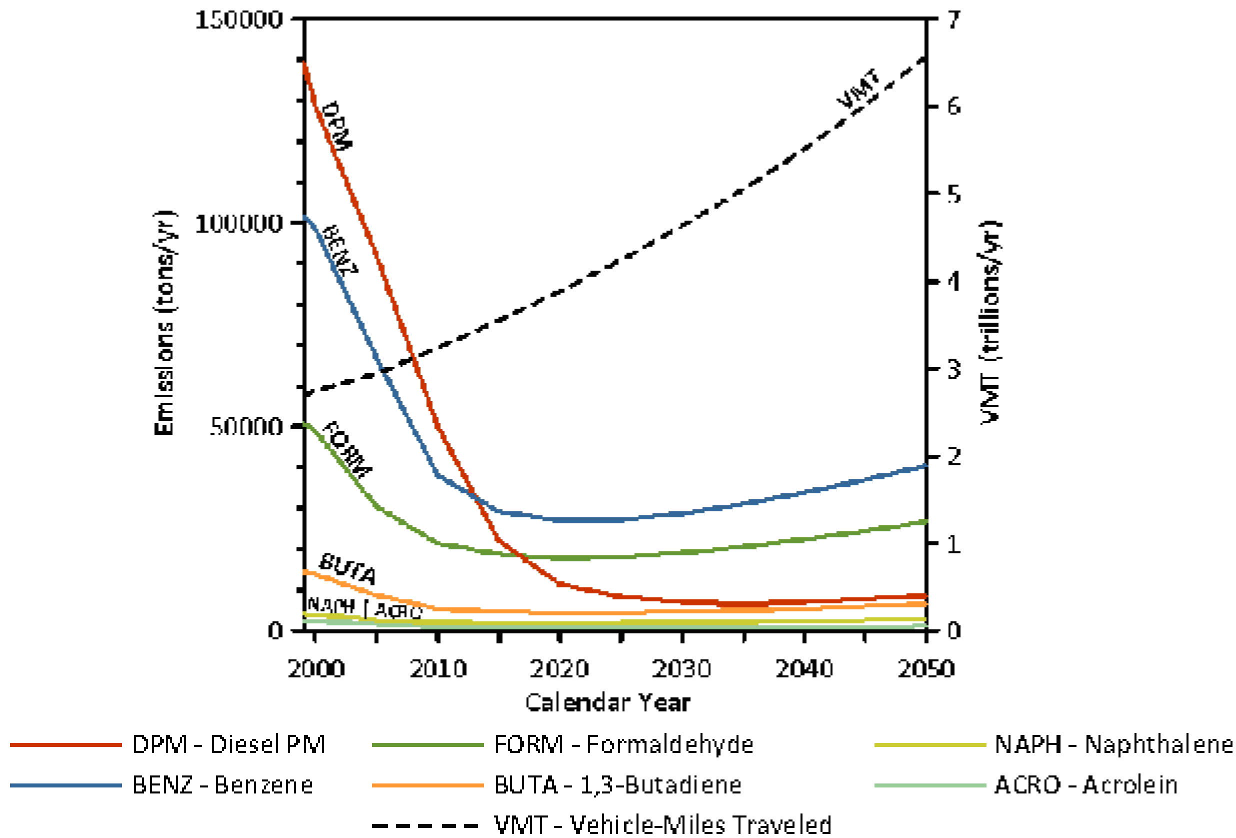

Figure 3. National MSAT Emission Trends 1999-2050 for Vehicles Operating on Roadways Using EPA's Mobile6.2 Model

These air toxic pollutants are emitted in lower quantities than the six criteria pollutants regulated by the EPA. However, exposure to these pollutants for long periods of time and in significant concentrations increases the chances of cancer or other serious health effects. These health effects can include damage to the immune system, neurological problems, reproductive, developmental, respiratory, and other serious health problems. The EPA continues to assess the risks of various exposure levels to these pollutants. The following is the EPA's most current information on the hazards of these pollutants:

- Benzene is characterized as a known human carcinogen.
- Acrolein is known for its acute non-cancerous effects that can cause great damage to the lungs when inhaled.

- Formaldehyde is a probable human carcinogen, based on limited evidence in humans, and sufficient evidence in animals.

- 1,3-butadiene is characterized as carcinogenic to humans by inhalation.

- Diesel exhaust (DE) is likely to be carcinogenic to humans by inhalation from environmental exposures. Diesel exhaust as reviewed in this document is the combination of diesel particulate matter and diesel exhaust organic gases.

- Exposure to large amounts of naphthalene may cause nausea, vomiting, diarrhea, blood in the urine, and jaundice (yellow coloration of the skin).

- Polycyclic is classified as a probable human carcinogen.

Diesel exhaust also causes chronic respiratory effects, possibly the primary noncancerous hazard from MSATs. Prolonged exposures may impair pulmonary function and could produce symptoms such as cough, phlegm, and chronic bronchitis.

For the purpose of the MSAT impact evaluation under NEPA, the Federal Highway Administration (FHWA) has developed the Interim Guidance on Air Toxic Analysis in NEPA Documents, a tiered approach for analyzing MSATs. The FHWA has identified three levels of analysis depending on a project's specific circumstances and potential MSAT impacts: (1) no analysis for projects with no potential for meaningful MSAT effects; (2) qualitative analysis for projects with low potential MSAT effects; and (3) quantitative analysis to differentiate alternatives for projects with higher potential MSAT effects.

3.7. Climate Change

While climate change has been a concern since at least 1988, as evidenced by the establishment of the United Nations and World Meteorological Organization's Intergovernmental Panel on Climate Change (IPCC), the efforts devoted to greenhouse gas (GHG) emissions reduction and climate change research and policy have increased dramatically in recent years. These efforts are primarily concerned with the emissions of GHG related to human activity that include carbon dioxide (CO_2), methane, nitrous oxide, tetrafluoromethane, hexafluoroethane, sulfur hexafluoride, HFC-23 (fluoroform), HFC-134a (s, s, s, 2 –tetrafluoroethane), and HFC-152a (difluoroethane).

In 2002, with the passage of Assembly Bill 1493 (AB 1493), California launched an innovative and pro-active approach to dealing with greenhouse gas emissions and climate change at the state level. Assembly Bill 1493 requires the California Air Resources Board (CARB) to develop and implement regulations to reduce automobile and light truck greenhouse gas emissions. These stricter emissions standards were designed to apply to automobiles and light trucks beginning with the 2009-model year; however, in order to enact the standards California needed a waiver from the U.S. Environmental Protection Agency (EPA). The waiver was denied by Environmental Protection Agency in December 2007 and efforts to overturn the decision had been unsuccessful. See California v. Environmental Protection Agency, 9th Cir. Jul. 25, 2008, No. 08-70011. However, on January 26, 2009, it was announced that EPA would reconsider their decision regarding the denial of California's waiver. On May 18, 2009, President Obama announced the enactment of a 35.5 mpg fuel economy standard for automobiles and light duty trucks which will take effect in 2012. On June 30, 2009 EPA granted California the waiver. California is expected to enforce its standards for 2009 to 2011 and then look to the federal government to implement equivalent standards for 2012 to 2016. The granting of the waiver will also allow California to implement even stronger standards in the future. The state is expected to start developing new standards for the post-2016 model years later this year.

On June 1, 2005, Governor Arnold Schwarzenegger signed Executive Order S-3-05. The goal of this Executive Order is to reduce California's GHG emissions to: 1) 2000 levels by 2010, 2) 1990 levels by the 2020 and 3) 80 percent below the 1990 levels by the year 2050. In 2006, this goal was further reinforced with the passage of Assembly Bill 32 (AB 32), the Global Warming Solutions Act of 2006. AB 32 sets the same overall GHG emissions reduction goals while further mandating that CARB create a plan, which includes market mechanisms, and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases." Executive Order S-20-06 further directs state agencies to begin implementing AB 32, including the recommendations made by the state's Climate Action Team.

With Executive Order S-01-07, Governor Schwarzenegger set forth the low carbon fuel standard for California. Under this executive order, the carbon intensity of California's transportation fuels is to be reduced by at least 10 percent by 2020.

Climate change and GHG reduction is also a concern at the federal level; however, at this time, no legislation or regulations have been enacted specifically addressing GHG emissions reductions and climate change. California, in conjunction with several environmental organizations and several other states, sued to force the U.S. Environmental Protection Agency (EPA) to regulate GHG as a pollutant under the Clean Air Act (Massachusetts vs. Environmental Protection Agency et al., 549 U.S. 497 (2007). The court ruled that GHG does fit within the Clean Air Act's definition of a pollutant, and that the EPA does have the authority to regulate GHG. Despite the Supreme Court ruling, there are no promulgated federal regulations to date limiting GHG emissions.

On December 7, 2009, the EPA Administrator signed two distinct findings regarding greenhouse gases under section 202(a) of the Clean Air Act:

- **Endangerment Finding:** The Administrator finds that the current and projected concentrations of the six key well-mixed greenhouse gases--carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6)--in the atmosphere threaten the public health and welfare of current and future generations.

- **Cause or Contribute Finding:** The Administrator finds that the combined emissions of these well-mixed greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution which threatens public health and welfare.

Although these findings did not themselves impose any requirements on industry or other entities, this action was a prerequisite to finalizing the U.S. Environmental Protection Agency's Proposed

Greenhouse Gas Emission Standards for Light-Duty Vehicles, which was published on September 15, 2009. On May 7, 2010 the final *Light-Duty Vehicle Greenhouse Gas Emissions* Standards and Corporate Average Fuel Economy Standards was published in the Federal Register.

The final combined U.S. Environmental Protection Agency and National Highway Traffic Safety Administration standards that make up the first phase of this national program apply to passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. They require these vehicles to meet an estimated combined average emissions level of 250 grams of carbon dioxide per mile, equivalent to 35.5 miles per gallon if the automobile industry were to meet this carbon dioxide level solely through fuel economy improvements. Together, these standards will cut greenhouse gas emissions by an estimated 960 million metric tons and 1.8 billion barrels of oil over the lifetime of the vehicles sold under the program (model years 2012-2016).

According to Recommendations by the Association of Environmental Professionals on How to Analyze GHG Emissions and Global Climate Change in CEQA Documents (March 5, 2007), an individual project does not generate enough greenhouse gas emissions to significantly influence global climate change. Rather, global climate change is a cumulative impact. This means that a project may participate in a potential impact through its incremental contribution combined with the contributions of all other sources of greenhouse gas. In assessing cumulative impacts, it must be determined if a project‘s incremental effect is ―cumulatively considerable.‖ See CEQA Guidelines sections 15064(i)(1) and 15130. To make this determination the incremental impacts of the project must be compared with the effects of past, current, and probable future projects. To gather sufficient information on a global scale of all past, current, and future projects in order to make this determination is a difficult if not impossible task.

As part of its supporting documentation for the Draft Scoping Plan, the California Air Resources Board recently released an updated version of the greenhouse gas inventory for California (June 26, 2008). Shown below, Figure 3, is a graph from that update that shows the total greenhouse gas emissions for California for 1990, 2002-2004 average, and 2020 projected if no action is taken.

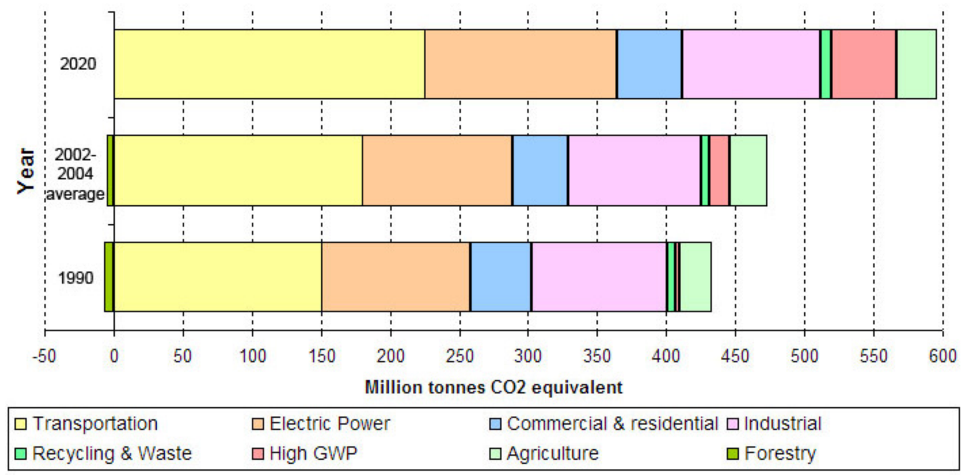

Figure 4. California GHG Inventory Forecast

Caltrans and its parent agency, the Business, Transportation, and Housing Agency, have taken an active role in addressing greenhouse gas emission reduction and climate change. Recognizing that 98 percent of California's greenhouse gas emissions are from the burning of fossil fuels and 40 percent of all human made greenhouse gas emissions are from transportation (see Climate Action Program at Caltrans (December 2006), Caltrans has created and is implementing the Climate Action Program at Caltrans that was published in December 2006. This document can be found at: http://www.dot.ca.gov/docs/ClimateReport.pdf.

Chapter 4. Air Quality Pollutants and Standards

As stated previously, federal, state and local agencies have established ambient air quality standards for six criteria pollutants: CO, O_3, PM_{10}, $PM_{2.5}$, NO_2, SO_2, and Pb as presented in Table 4-1. O_3 and PM are generally considered to be regional pollutants because they or their precursors affect air quality on a regional scale. Pollutants such as CO, PM, NO_2, SO_2, and Pb are considered to be local pollutants because they tend to accumulate in the air locally. In the project area, PM and O_3, are pollutants of particular concern as the Basin is currently designated as nonattainment for $PM_{2.5}$ and O_3 and a maintenance area for $PM_{10.}$

Carbon Monoxide (CO)

CO is a public health concern because it combines readily with hemoglobin and thus reduces the amount of oxygen transported in the bloodstream. Effects on humans range from slight headaches to nausea to death. For urban areas, the internal combustion engines of motor vehicles are the principal sources of CO that cause ambient air quality levels to exceed the NAAQS. State and federal CO standards have been set for both 1-hour and 8-hour averaging times. The state 1-hour standard is 20 parts per million (ppm) by volume, and the federal 1-hour is 35 ppm. Both the state and federal standards are 9 ppm for the 8-hour averaging period. High CO levels develop primarily during winter when periods of light wind combine with ground-level temperature inversions. These conditions result in reduced dispersion of vehicle emissions. In addition, motor vehicles emit more CO in cool temperatures than in warm temperatures.

Ozone (O_3)

O_3 is not emitted directly into the air but is formed by a photochemical reaction in the atmosphere. O_3 precursors, which include NO_x and ROGs, react in the atmosphere in the presence of sunlight to form ozone. Ground-level and stratosphere-level O_3 share the same chemical structure; however, their effects differ greatly due to their positions in the atmosphere. Ground-level O_3 has adverse effects due to its potential impacts to human health, while stratospheric O_3 has a protective effect by shielding the earth's surface from harmful radiation. When O_3 is inhaled, it can cause a variety of health problems such as chest pain, coughing, throat irritation, and congestion. State and federal standards for O_3 have been set for a 1-hour averaging time. The state requires that O_3 concentration not exceed 0.09 ppm of O_3 being produced in a given area in 1 hour. The federal 1-hour O_3 standard was revoked by the EPA in 2005. The federal 8-hour O_3 standard is 0.075 ppm and the state standard is 0.07 ppm.

Particulate Matter (PM_{10}) & ($PM_{2.5}$)

PM emissions are generated by a wide variety of sources, including agricultural activities, industrial emissions, dust suspended by vehicle traffic and construction equipment, and secondary aerosols formed by reactions in the atmosphere. The NAAQS for particulate matter applies to two classes of particulate: $PM_{2.5}$, particulate matter 2.5 microns or less in diameter, and PM_{10}, particulate matter 10 microns or less in diameter. PM of ten microns in diameter and smaller pose the greatest health problems by being able to bypass the nose and throat's natural filtration systems and enter deep into the lungs, heart, and bloodstream. This can cause difficulty with breathing (including aggravating asthma), irregular heartbeat, nonfatal heart attacks, and premature death in people with heart or lung problems. The state PM_{10} standards are 50 micrograms per cubic meter ($\mu g/m^3$) as a 24-hour average and 20 $\mu g/m^3$ as an annual arithmetic mean. The federal PM_{10} standard is 150 $\mu g/m^3$ as a 24-hour average. The federal standards for $PM_{2.5}$ are 35 $\mu g/m^3$ and 15 $\mu g/m^3$ for a 24 hour and an annual arithmetic mean averaging period, respectively. The state standard for $PM_{2.5}$ is 12 $\mu g/m^3$ as an annual arithmetic mean. There is no separate state standard for 24-hour $PM_{2.5}$.

Nitrogen Dioxide (NO_2)

NO_2 belongs to a family of highly reactive gases called NO_x. These gases form when fuel is burned at high temperatures, and come principally from motor vehicle exhaust and stationary sources such as electric utilities and industrial boilers. A suffocating, brownish gas, NO_2 is a strong oxidizing agent that reacts in air to form corrosive nitric acid, as well as toxic organic nitrates. It also plays a major role in the atmospheric reactions that produce ground-level O_3 (or smog), which can trigger serious respiratory problems. The EPA's health-based national air quality standard for NO_2 is 0.053 ppm.

Recently, the Northeast States for Coordinated Air Use Management (NESCAUM) have proposed to the EPA a new standard for NO_2 based on new epidemiologic and toxicological data that support the need for a short-term NO_2 standard. The NESCAUM also suggests that the current annual standard, without a supplemental short-term standard, may not be adequately protective of public health. With this evidence, the EPA and the Clean Air Scientific Advisory Committee (CASAC) have recognized the need for a short-term NO_2 standard. Further, short-term NO_2 exposures (i.e., 30 minutes to 24 hours) have been linked to increased airway reactivity, worsened control of asthma, and increased incidences of respiratory illnesses and symptoms. The NESCAUM recommends that the EPA establish a one-hour NO_2 NAAQS at a level no higher than 100 ppb, using the 99th percentile option.

Sulfur Dioxide (SO_2)

SO_2 belongs to the family of sulfur oxide gases (SO_x). These gases are formed when fuel containing sulfur (mainly coal and oil) is burned, and during metal smelting and other industrial processes. SO_2 contributes to respiratory illness, particularly in children and the elderly, and aggravates existing heart and lung diseases. SO_2 also contributes to the formation of acid rain, which causes damages to trees, crops, historic buildings, and monuments; and makes soils, lakes, and streams acidic. The EPA's health-based national air quality standard for SO_2 is 0.030 ppm (measured on an annual average) and 0.14 ppm (measured over 24 hours).

Lead (Pb)

Pb is a metal found naturally in the environment as well as in manufactured products. Once taken into the body, Pb distributes throughout the body in the blood and is accumulated in the bones. Depending on the level of exposure, lead can adversely affect the nervous system, kidney function, immune system, reproductive and developmental systems and the cardiovascular system. The major sources of Pb emissions have historically been motor vehicles and industrial sources. Due to the phase out of leaded gasoline, metal processing is the major source of Pb emissions to the air today. The highest levels of Pb in air are generally found near lead smelters. Other stationary sources are waste incinerators, utilities, and lead-acid battery manufacturers.

On October 15, 2008 the EPA signed a final rule to tighten allowable Pb concentrations from 1.5 $\mu g/m^3$ to 0.15 $\mu g/m^3$. The EPA said it strengthened the standards after a thorough review of the science on lead, advice from the Clean Air Scientific Advisory Committee, and consideration of public comments. The EPA has noted that the existing monitoring network for lead is not sufficient to determine whether many areas of the country would meet the revised standards. As a result, the EPA is redesigning the nation's lead monitoring network. No later than October 2011, the EPA will designate areas that must take additional steps to reduce lead air emissions. States will have five years to meet the new standards after designations take effect.

Greenhouse Gases (GHG)

Global Climate Change (GCC) refers to changes in average climatic conditions on Earth as a whole, including temperature, wind patterns, precipitation and storms. Global temperatures are moderated by naturally occurring atmospheric gases, including water vapor, carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O), which are known as greenhouse gases (GHGs). These gases allow solar radiation (sunlight) into the Earth's atmosphere, but prevent radioactive heat from escaping, thus warming the Earth's atmosphere. Gases that trap heat in the atmosphere are often called greenhouse gases, analogous to a greenhouse. GHGs are emitted by both natural processes and human activities. The accumulation of GHGs in the atmosphere regulates the Earth's temperature. Without these natural GHGs, the Earth's temperature would be about 61º Fahrenheit cooler (California EPA 2006). Emissions from human activities, such as electricity production and vehicle use, have elevated the concentration of these gases in the atmosphere.

GHGs have been at the center of a widely contested political, economic, and scientific debate surrounding GCC. Although the conceptual existence of GCC is generally accepted, the extent to which GHGs contribute to it remains a source of debate. The State of California has been at the forefront of developing solutions to address GCC. GCC refers to any significant change in measures of climate, such as average temperature, precipitation, or wind patterns over a period of time. GCC may result from natural factors, natural processes, and/or human activities that change the composition of the atmosphere and alter the surface and features of land.

Global climate change attributable to anthropogenic (human) emissions of GHGs (mainly carbon dioxide [CO_2], methane [CH_4] and nitrous oxide [N_2O]) is currently one of the most important and widely debated scientific, economic and political issues in the United States. Historical records indicate that global climate changes have occurred in the past due to natural phenomena (such as during previous ice ages). Some data indicate that the current global conditions differ from past climate changes in rate and magnitude.

The United Nations Intergovernmental Panel (Panel) on Climate Change constructed several emission trajectories of GHGs needed to stabilize global temperatures and climate change impacts. The Panel concluded that a stabilization of GHGs at 400 to 450 ppm CO_2 equivalent concentration is required to keep global mean warming below 35.6º Fahrenheit (2º Celsius), which is assumed to be necessary to avoid dangerous climate change (Association of Environmental Professionals 2007). State law defines greenhouse gases as any of the following compounds: CO_2, CH_4, N_2O, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulfur hexafluoride (SF_6) (California Health and Safety Code Section 38505(g).) CO_2, followed by CH_4 and N_2O, are the most common GHGs that result from human activity.

Table 4-1. Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Concentrations	
		State Standards (CAAQS)	Federal Standards (NAAQS)
Ozone (O_3)	8 hour	.07 ppm (137 µg/m^3)	.075 ppm (157 µg/m^3)
	1 hour	.09 ppm (180 µg/m^3)	0.12 ppm[1]
Carbon Monoxide (CO)	8 hour	9 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)
	1 hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)
Nitrogen Dioxide (NO_2)	Annual arithmetic mean	0.030 ppm	0.053 ppm (100 µg/m^3)
	1 hour	0.18 ppm	53 ppm
Sulfur Dioxide (SO_2)	Annual arithmetic mean	NA	.03 ppm (80 µg/m^3)
	24 hour	.04 ppm (105 µg/m^3)	.14 ppm (365 µg/m^3)
	1 hour	.25 ppm (655 µg/m^3)	75 ppb
Particulate Matter (PM_{10})	Annual arithmetic mean	20 µg/m^3	NA
	24 hour	50 µg/m^3	150 µg/m^3
Particulate Matter – fine ($PM_{2.5}$)	Annual arithmetic mean	12 µg/m^3	15 µg/m^3
	24 hour	No separate state standard	35 µg/m^3 [2]
Sulfates	24 hour	25 µg/m^3	NA
Lead (Pb)	Rolling 3-month Average	NA	0.15 µg/m^3
	30-day average	1.5 µg/m^3	NA
	Quarterly Average		NA
Hydrogen Sulfide	1 hour	.03 ppm (42 µg/m^3)	NA
Vinyl Chloride (chloroethene)	24 hour	.01 ppm (26 µg/m^3)	NA
Visibility-Reducing Particles	8 hour (10:00 a.m. to 6:00 p.m. Pacific Standard Time)	Extinction coefficient of 0.23 kilometer—visibility of 10 miles or more due to partic1es when relative humidity is less than 70 percent.	NA

Notes:

mg/m^3=milligrams per cubic meter; NA=no standard implemented; ppm=part per million; µg/m^3=micrograms per cubic meter; ppb=parts per billion

[1] (a) EPA revoked the 1-hour ozone standard in all areas, although some areas have continuing obligations under that standard ("anti-backsliding").

(b) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is < 1.

[2] EPA Region 9, correspondence states that the old $PM_{2.5}$ 24-hour standard of 65 µg/m^3 be utilized as this standard was the standard provided when the SIP was last approved.

Source: California Air Resources Board (11/17/08) and Environmental Protection Agency (10/13/06)

Chapter 5. Air Quality Conformity

The CAA Amendments of 1990 and California state regulation require all transportation projects located in air quality maintenance and nonattainment areas in the state of California to follow conformity requirements promulgated in their respective regulations (40 CFR Part 93 and Rule 9120) and to conform to the SIP. The SIP is a collection of regulations, programs and policies outlining how the state will clean up polluted areas. By conforming to the SIP, the proponent demonstrates that the transportation project will not add any new air quality violations to the area, will not worsen the current violations, and/or will not delay the attainment goals of the NAAQS.

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) made a number of revisions to the Clean Air Act's transportation conformity provisions. In particular, SAFETEA-LU made the following changes:

1. Changes 18-month trigger to two years for redetermination of conformity after certain air quality planning actions.
2. Changes frequency of conformity for plans and Transportation Improvement Programs (TIPs) from every 3 years to every 4 years.
3. Provides option for MPOs to shorten the time horizon for conformity determination.
4. Allows Transportation Conformity Measures (TCMs) to be substituted or to be added to existing TCMs without a SIP mechanism.
5. Provides a 12-month grace period before a lapse occurs after an applicable deadline is missed.
6. Limits Conformity SIPs to interagency consultation and enforcement provisions.

On January 10, 2008 the EPA released a revision to the Transportation Conformity Rule that provides states and local governments the following:

- more time to meet conformity requirements,
- more flexibility before the consequences of not meeting conformity requirements apply, and
- the option of shortening the timeframe of conformity determinations.

Chapter 6. Transportation Conformity

The CAA requires that all transportation plans, programs, and projects that are funded by or approved under Title 23 and 49 of United States Code or Federal Transit Laws conform to state or federal air quality plans. This process involves passing an air quality conformity test that will forecast future emissions of air pollution to determine whether the amount of future pollution resulting from the project would be within the allowable limit for motor vehicle emissions.

Transportation conformity must be determined for all pollutants for which a region is designated as a nonattainment or maintenance area. In the SCAQMD, those pollutants are PM, O_3, and CO. Transportation projects also generate CO, which is considered a localized pollutant. CO modeling is required to determine whether a transportation project would cause or contribute to localized violations of CO NAAQS.

Regional conformity must be determined based on a full study at least every 3 years. In California, it is determined at least every two years when the state-required Regional Transportation Plan (RTP) updates are done. In addition, a new FTIP is required every four years, for which a conformity determination is required. Amendments to both the RTP and TIP between mandated conformity analyses also must have conformity demonstrated, including a full-scale revision of the regional analysis if regionally significant projects are added, deleted, or significantly modified.

Regional conformity is demonstrated by showing that the project is included in a conforming RTP and TIP with substantially the same design concept and scope that was used for the regional conformity analysis.

Project level conformity is demonstrated by showing that a project will not cause a localized exceedance of CO and/or PM_{10} standards, and that it will not interfere with “timely implementation” of TCMs called out in the SIP.

The Final Rule has the following key elements:

- This rule requires that $PM_{2.5}$ hot spot analyses be performed only for ”projects of air quality concern” (POAQCs). Examples of POAQCs include proposed new or expanded transportation facilities with significant diesel traffic, intermodal freight or bus terminals, and major highway projects and congested intersections involving significant diesel traffic. No hot spot analyses will be required for most projects in $PM_{2.5}$ areas, because most projects are not an air quality concern. This final rule also streamlines existing PM_{10} hot spot requirements in a similar way.

- The streamlined approach in this final rule will ensure that transportation and air quality agencies in $PM_{2.5}$ and PM_{10} areas use their resources efficiently, while achieving clean air goals.

- In both $PM_{2.5}$ and PM_{10} areas, a quantitative hot spot analysis is not required until the EPA issues a new motor vehicles emissions model capable of estimating local emissions as well as future hot spot modeling guidance. Qualitative analyses will apply in the interim. Further, due to the attainment status of the project area, this project will undergo interagency consultation with Caltrans to analyze potential impacts of this project.

- This rule extends an existing flexibility by allowing the U.S. Department of Transportation to make "categorical hot spot findings," which waive $PM_{2.5}$ and PM_{10} hot spot reviews for categories of projects where modeling shows that there is no air quality concern.

Chapter 7. Regional Climate and Topography

The project is located in an area of Riverside County that is within the western portion of the Salton Sea Air Basin (Basin). The Basin portion of Riverside County is separated from the South Coast Air Basin (SCAB) by the San Jacinto Mountains and from the Mojave Desert Air Basin (MDAB) to the east by the San Bernardino Mountains.

The climate of the Basin is a continental, desert-type, with hot summers, mild winters, and very little annual rainfall. Precipitation is less than six inches annually and occurs mostly in the winter months from active frontal systems, and in the late summer months from thunderstorms. Temperatures exceed 100 degrees Fahrenheit, on the average, for four months each year, with daily highs near 110 degrees Fahrenheit during July and August. Summer nights are very mild with minimum temperatures in the mid-70s. During the winter season, daytime highs are quite mild, but the dry air is conducive to nocturnal radiational cooling, with early morning lows around 40 degrees.

The Basin is exposed to frequent gusty winds. The strongest and most persistent winds typically occur immediately to the east of Banning Pass, which is noted as a wind power generation resource area. Aside from this locale, the wind conditions in the remainder of the valley are geographically distinct. Stronger winds tend to occur in the open mid-portion of the valley, while lighter winds tend to occur closer to the foothills. Less frequently, widespread gusty winds occur over all areas of the valley.

Within the Basin, a natural sand migration process called "blow sand" has direct and indirect effects on air quality. This natural sand migration process produces PM_{10} in two ways: 1) by direct particle erosion and fragmentation (natural PM_{10}), and 2) by secondary effects, as sand deposits on road surfaces are ground into PM_{10} by moving vehicles and resuspended in the air (man-made PM_{10}).

Under natural conditions, the overall region of blow sand activity encompasses approximately 130 square miles extending from near Cabazon to Indio, and lying primarily between the San Gorgonio Mountains and the Whitewater River channel on the southwest and San Bernardino Mountains and the Indio Hills on the northeast. Sands supplied by floodwaters to the westerly and northerly portions of the region are transported by strong, essentially unidirectional winds to the southerly portion of the region. Transporting winds emanate from the San Gorgonio Pass and occur most frequently and with the greatest intensity during the spring and early summer months. Once having entered the Basin, the winds tend to dissipate rapidly in the southeasterly direction, losing virtually their entire capability of transporting significant quantities of sand before reaching the lower portion of the Whitewater River channel near Indio.

The alluvial floodplain of the Whitewater River extending between Windy Point and Indian Avenue, together with the alluvial floodplain extending along the base of the Indio Hills, constitutes the primary blow sand source areas. The large accumulation or deposition area, which presently contains over two billion cubic yards of wind deposited sand, extends over the southerly and easterly portions of the region.

Chapter 8. Emissions Analyses

An air quality analysis was conducted to assess changes in air quality created by the operation of the project on the surrounding area. Potential air quality impacts from the operation of the project are primarily associated with the redistribution of vehicles to the additional right-turn lane. Impacts generated from the redistribution of traffic may include incremental changes to vehicle miles traveled (VMT) and average daily traffic (ADT) along SR 111. Changes in these traffic patterns along the highway could potentially change the overall concentrations of pollutant levels from vehicle exhaust emissions throughout the project area. Operation related emissions were assessed on a project-level.

The pollutants of primary concern when assessing project-level impacts of transportation projects are CO, PM, and O_3. Elevated concentrations of these pollutants tend to accumulate near areas of heavy traffic congestion where average vehicle speeds are low. Tailpipe emissions are of concern when assessing localized impacts of CO, PM_{10}, and $PM_{2.5}$ along paved roads.

MSATs and GHG emissions were assessed on a project-level basis. MSATs are potentially hazardous toxic pollutants associated with transportation projects while GHG emissions are related to climate change and have been the recent focus of federal and state agencies for analyzing potential impacts. Potential changes in vehicle hours traveled (VHT) or VMT can add to GHG pollutant emissions.

8.1. Sensitive Receptor

Aerial images of the project area were used to identify land sensitive receptors within the project area. Land uses spanning SR 111 vary from residential to heavily commercial, industrial, and airport. The Palms Springs International Airport is located just southeast of the intersection. Single-family residences, north of SR 111, were identified within 500 feet of the project location. Generally, people that are more susceptible to air quality are young children, the elderly, and people with immune deficiencies. Therefore, land uses, such as schools, daycare facilities, hospitals, elderly care facilities, and other areas that are occupied by people susceptible to air quality pollutants are considered sensitive air quality receptors. However, no schools, daycare facilities, hospitals, or elder care facilities were found within 500 feet of the Vista Chino (SR 111) and Farrell Drive intersection.

8.2. Existing Air Quality

Regional air quality is monitored locally by the SCAQMD in conjunction with CARB. These two agencies operate a network of air quality monitoring stations throughout the Basin. Within the city of Palm Springs there is a monitoring stations that records concentrations for five of the seven criteria pollutants. The SCAQMD relies on one or more monitoring stations to document local air pollutant concentration levels. The EPA determines regional air quality status based on data collected from permanent monitoring stations. An area is classified as “attainment" if the primary NAAQS have been achieved and "non-attainment" if the NAAQS are not achieved. Within the project area, NO_2, SO_2, and Pb are currently in attainment with federal and state standards while PM_{10} and O_3 are designated as nonattainment. Furthermore, the Basin is also a maintenance area for CO and characterized as unclassified for $PM_{2.5}$. The air quality status of the Basin is summarized below in Table 8-1.

Table 8-1. State and Federal Conformity

Pollutant	Federal Conformity	State Conformity
8-hour Ozone (O_3)	Non-Attainment	Non-Attainment
Carbon Monoxide (CO)	Attainment	Attainment
Particulate Matter (PM_{10})	Non-Attainment	Non-Attainment
Particulate Matter ($PM_{2.5}$)	Unclassified	Unclassified
Sulfur Dioxide (SO_2)	Unclassified	Attainment
Nitrogen Dioxide (NO_2)	Attainment	Attainment
Hydrogen Sulfide (H_2S)	No standards	Unclassified
Source: SCAQMD website and CARB website, December 2010.		

The Palm Springs monitoring facility located at the Palm Springs Fire Department – Fire Station #3, as shown in Figure 5, is the nearest air quality monitoring station to the project area which provides monitoring data for NO_2, CO, O_3, PM_{10} and $PM_{2.5}$. Currently, there are no monitoring stations that measure SO_2 or Pb concentrations near the project area because there has not been a credible risk of either pollutant violating federal or state standards in this area. NO_2 concentrations are not of concern due to the limited amount of emissions related to the operation of the project. NO_2 emissions measured at the monitoring facility are well below the federal and state standards and have not exceeded standards for over ten years.

Table 8-2 presents the last three years of monitoring data at the project's closest monitoring station. Over the past three years, CO concentrations in the project area have been well below the 1-hour and 8-hour federal and state standards and no exceedances have been recorded for over ten years. The EPA revoked the O_3 1-hour standard in June 2005; however, there are still CAAQS for 1-hour concentrations. Therefore, both 1-hour and 8-hour O_3 concentrations are included in Table 8-2. Concentrations collected demonstrate that the area has exceeded the 8-hour O_3 federal and state standards. In 2008, O_3 exceeded federal standards, in 2009 and 2010 there was a decrease in exceedances, with a slight increase in 2010 from 2009 conditions.

Table 8-2. Ambient Air Quality at Palm Springs Monitoring Station[1]

	Ozone (O_3)		Carbon Monoxide (CO)		$PM_{2.5}$		PM_{10}	
	Max 1-hour	**Max 8-hour**	**Max 1-hour**	**Max 8-hour**	**Max 24-hour**	**Annual Arithmetic Average**	**Max 24-hour**	**Annual Arithmetic Average**
Federal Standard	No Federal Standard	0.075 ppm	35 ppm	9.0 ppm	65[a] µg/m^3	15 µg/m^3	150 µg/m^3	No Federal Standard
State Standard	0.09 ppm	0.07 ppm	20 ppm	9.0 ppm	No State Standard	12 µg/m^3	50 µg/m^3	20 µg/m^3
2008	0.112 ppm	0.101 ppm	1.0 ppm	0.5 ppm	17.3 µg/m^3	5.19 µg/m^3	75 µg/m^3	27 µg/m^3
2009	0.120 ppm	0.098 ppm	2.3 ppm	1.6 ppm	21.8 µg/m^3	ND	140 µg/m^3	ND
2010	0.115 ppm	0.099 ppm	2.4 ppm	1.7 ppm	ND	ND	350 µg/m^3	ND

Notes:
ppm = parts per million
µg/m^3 = micrograms per cubic meter
ND = No Data Available
[a] EPA, Region 9, email states that the old $PM_{2.5}$ 24-hour standard of 65 µg/m^3 be utilized; since this standard was the standard provided when the SIP was last approved.
(1) Address of monitoring station: 590 Racquet Club Avenue, Palm Springs, CA
Source: EPA web page, http://www.epa.gov/air/data/geosel.html
CARB web page, http://www.arb.ca.gov/aqmis2/aqdselect.php

Non-attainment of the PM_{10} federal standard is demonstrated when concentrations are exceeded more than once per year averaged over three years. Maximum 24-hour PM_{10} concentrations shown in Table 8-2 exceed both the federal and State the standards.

Monitored data presented in Table 8-2 indicate that the maximum $PM_{2.5}$ concentrations collected did not exceed the 24-hour federal standard in the years 2008 and 2009. Concentrations are not available from the air monitoring station are not available for the year 2010.

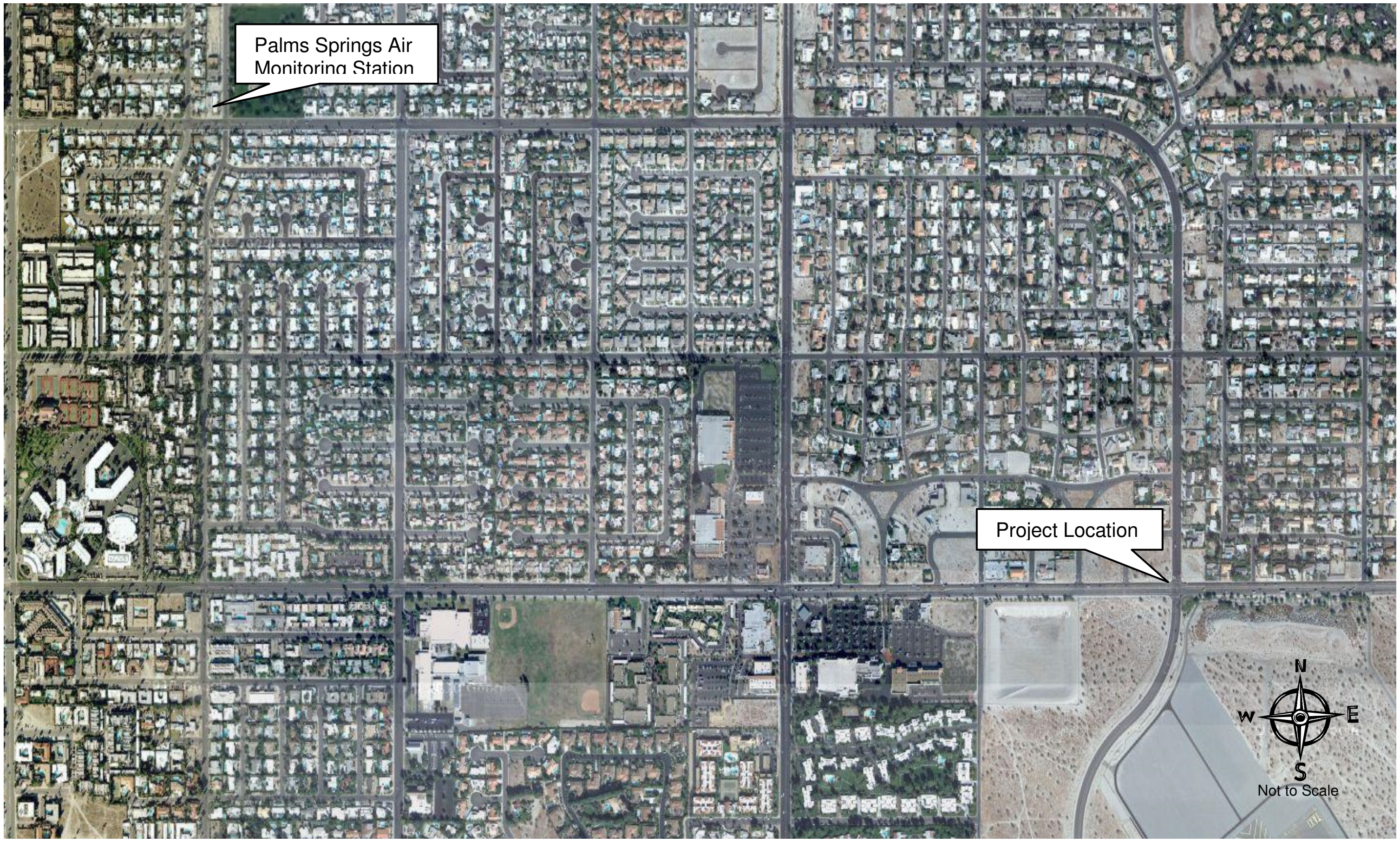

Figure 5. Palms Springs Air Monitoring Station Location

8.3. Regional Analysis

The project will involve intersection channelization and qualified as a conformity exemption as listed in 40 CFR 93.127, Table 3, and is exempt from requirements to determine regional conformity.

8.4. Project-Level Analysis

The additional right-turn lane at the intersection of Vista Chino (SR 111) and Farrell Drive will relieve traffic congestion and delay time at the local intersection and will improve circulation to accommodate future traffic increases. These project improvements are considered to provide a minimal impact to air quality in the surrounding area. The pollutants of concern when analyzing transportation project-level impacts are CO, PM_{10}, and $PM_{2.5}$ as these pollutants have a tendency to accumulate around intersections with heavy traffic congestion where vehicles are traveling at slower speeds.

8.4.1. Carbon Monixide (CO) Analysis

The project is located in a CO attainment area; however, federal air quality conformity standards must demonstrate transportation activities associated with the project will not cause new air quality violations, worsen existing violations, or delay timely attainment of the NAAQS. To satisfy this requirement localized CO impacts resulting from the project alternative were evaluated using the following Caltrans' screening procedures outlined in the CO Protocol.

1. **Is this project exempt from all emissions analyses?**
   a. No. This project does not qualify for an outright exemption.
2. **Is this project exempt from regional emissions analyses?**
   a. Yes. This project will involve intersection channelization and is qualified as a project exempt from regional emissions analysis.

The proposed project is not subject to further regional conformity analyses. Rather, it is required to undergo an examination of local CO impacts. The local analysis will be performed utilizing the flowchart in Section 4.0 of the CO Protocol. As stated in the Protocol, projects may be deemed satisfactory if it can be determined that the project does not lead to an increase in emissions. The following questions were used as a guidelines to determine potential local CO impacts from the operation of the proposed project:

1. **Is this project in a CO nonattainment area?**
   a. No, this project is not located in a CO nonattainment area.
2. **Was the area redesignated as "attainment" after the 1990 Clean Air Act?**
   a. Yes, the area was redesignated to attainment after the 1990 Clean Air Act.

3. Has "continued attainment" been verified with the local Air District, if appropriate?

a. Yes, continued attainment has been verified with the SCAQMD.

4. Does the project worsen air quality?

a) No, the project does not worsen air quality. Operation of the proposed project will not significantly increase the percentage of vehicles operating in cold start mode. The proposed project will not significantly increase traffic volumes. Further, the proposed project is expected to improve traffic flow and decrease delay times.

Traffic data obtained from the *Traffic Study Memorandum* demonstrates that the implementation of the project will not significantly change traffic volumes at the intersection of Vista Chino and Farrell Drive. Traffic volumes remain the same for both Build and No Build Conditions and delay times at the intersection decrease in the Build conditions from No Build conditions. Furthermore, the LOS of the intersection improves with the implementation of the proposed project, as shown in Table 8-3. Due to the improvements made to traffic flow and delay time the operation of the proposed project is not expected to cause a CO hot-spot.

Table 8-3. LOS at Vista Chino and Farrell Drive

Intersection	Existing LOS	No Build 2035 LOS	Build 2035 LOS
Vista Chino and Farrell Drive	D	F	D
Source: KOA Corporation, May 2011			

8.4.2. Particulate Matter (PM) Analysis

The project is located in the Salton Sea Basin, which is designated as nonattainment for PM_{10} and an unclassified area for $PM_{2.5}$. Therefore, a qualitative PM_{10} and $PM_{2.5}$ hot-spot analysis was performed following the guidance provided by Caltrans and the EPA's Transportation Conformity Guidance for Qualitative Hot-Spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas to satisfy conformity requirements. The EPA PM guidance identified two recommended methods for performing a qualitative analysis: comparing the project with other projects that were constructed in the past and built in locations similar to the project area with a nearby PM monitoring station, or reviewing other air quality studies that were performed in the project area for comparison. In reviewing the project area, no recent projects were identified that would be similar in nature to the project and the nearest monitoring PM stations is greater than ¼ mile from the project area. In lieu of not having any similar projects for comparison, agency reviewers recommended that the qualitative analysis determine whether the project would be "a project of air quality concern". The following are examples provided in the EPA's guidance of projects of air quality concern:

1. A project on a new highway or expressway that serves a significant volume of diesel truck traffic, such as facilities with greater than 125,000 AADT and eight percent or more of such AADT is diesel truck traffic;

2. New exit ramps and other highway facility improvements to connect a highway or expressway to a major freight, bus, or intermodal terminal;

3. Expansion of an existing highway or other facility that affects a congested intersection (operated at LOS D, E, or F) that has a significant increase in the number of diesel trucks; and

4. Similar highway projects that involve a significant increase in the number of diesel transit busses and/or diesel trucks.

Upon reviewing preliminary traffic data, it was determined that the AADT information received does not classify the project as a project of air quality concern. As shown in Table 8-4, the highest AADT volumes for future build conditions is on the Vista Chino segment, the volumes shown for this segment are well below 125,000 AADT. No segment along the roadway has an average AADT over 125,000. The traffic data supports characterizing the project as a new or expanded highway project that primarily services gasoline vehicle traffic (i.e., does not involve a significant number or increase in the number of diesel vehicles) and involves congested intersections operating at LOS D, E, or F.

Table 8-4. Annual Average Daily Traffic by Segment

Road Segment	Year	AADT
Farrell Drive (0.5mile)	Existing 2010	14,025
	Opening 2012	14,450
	Build-out 2035	20,350
Vista Chino (0.5mile)	Existing 2010	26,400
	Opening 2012	27,200
	Build-out 2035	38,300

Source: KOA Corporation, January 2011

8.4.3. Ozone (O_3) Analysis

The project is located in an area designated as nonattainment for O_3, however, there is no approved modeling method or guidance in analyzing O_3 at a project-level. Therefore, a qualitative O_3 analysis was performed to estimate the potential impacts of the operation of the project. Regional plans, programs, and documents that have been federally approved will be utilized in identifying the Basin's proposed activities to reduce O_3 precursor emissions. The SCAQMD adopted the 1997 AQMP in November 1996. The 1997 AQMP provides updated technical information relative to baseline emission inventories and control measures to achieve the federal ozone air quality standards. On January 23, 1997, CARB approved those portions of the 1997 AQMP pertaining to the federal CAA requirements for SIP submittals. On January 12, 1999, the U.S. EPA proposed partial approval/disapproval of the O_3 portion of the 1997 AQMP as a revision to the 1994 California Ozone SIP (64 FR 1770). On December 10, 1999 the SCAQMD Governing Board adopted the 1999 Amendment to the 1997 Ozone SIP. This plan was adopted to assure attainment of the federal 8-hour ozone standard for all residents of the Basin.

The 1999 Amendment specifically included the following plans, program, and strategies:

- Revises the 1997 AQMP control strategy to reflect adoption of 14 stationary and mobile source control measures that the SCAQMD is responsible for implementing. In addition, one existing rule was amended to address concerns raised by CARB.

- Adds four short-term stationary source control measures to reduce VOC emissions. These short-term control measures represent implementation of portions of the long-term stationary source control measures such that the reliance on the long-term controls is reduced.

- Adds four new short-term stationary source control measures to reduce VOC emissions in the near-term. Many of these measures were developed as part of the SCAQMD's technical assessments for the next comprehensive AQMP revision and through compliance/emission audits of various stationary sources. The emission reductions associated with these measures would further reduce the reliance on the long-term measures identified in the 1997 AQMP.

- Changes the adoption/implementation schedule for 13 short-term stationary source control measures provided in the 1997 AQMP. Three of the 13 control measures are to be implemented earlier.

- Revises the VOC emission budgets for some of the interim milestone years.

- Provides explicit SIP emissions commitment in attaining the federal ozone air quality standard.

The SCAQMD has established thresholds of significance for O_3 precursors for the operation of transportation projects, 55 pound per day for ROGs and 55 pounds per day for NO_x emissions. The operation of the project will have a minimal impact on the Basin with the implementation control measures incorporated from the plans and programs discussed above. Further, the project was incorporated in the conforming FTIP.

Therefore, it is anticipated that the project would not worsen existing air quality, or cause an exceedance, or cause any new violations of the O_3 standards. Regional transportation conformity requirements are satisfied through the inclusion of the project in the conforming FTIP.

8.4.4. Mobile Source Air Toxics (MSATs) Analysis

The project acts as a corridor for commercial trucks traveling through the City of Palm Springs. On September 30, 2009 the FHWA issued interim guidance on how MSATs should be addressed in NEPA documents for highway projects. The FHWA developed a tiered approach for analyzing MSATs in NEPA documents. Depending on the specific project circumstances, the FHWA has identified three levels of analysis:

1. No analysis for exempt projects with no potential for meaningful MSAT effects: for example, projects qualifying as a categorical exclusion under 23 CFR 771.117(c), projects exempt under the CAA conformity rule under 40 CFR 93.126, or other projects with no meaningful impacts on traffic volumes or vehicle mix.

2. Qualitative analysis for projects with low potential MSAT effects: for example, minor widening projects, new interchanges, projects that improve operations of highways, transit, or freight without adding substantial new capacity or without creating a facility that is likely to meaningfully increase emissions.

3. Quantitative analysis to differentiate alternatives for projects with higher potential MSAT: Projects that would be in this category must:

   a. Create or significantly alter a major intermodal freight facility that has the potential to concentrate high levels of DPM in a single location; or

   b. Create new or add significant capacity to urban highways such as interstates, urban arterials, or urban collector-distributor routes with traffic volumes where the average annual daily traffic (AADT) is projected to be in the range of 140,000 to 150,000 or greater by the design year; and

   c. Proposed to be located in proximity to populated areas or in rural areas in proximity to concentrations of vulnerable populations (i.e. schools, nursing homes, hospitals).

Exempt Projects or Projects with No Meaningful Potential MSAT Effects:

The types of projects included in this category are:

- Projects qualifying as a categorical exclusion under 23 CFR 771.117(c);

- Projects exempt under the Clean Air Act conformity rule under 40 CFR 93.126; or

- Other projects with no meaningful impacts on traffic volumes or vehicle mix.

Upon review of the build alternative and the FHWA guidance categories described above, the project is classified as a minor widening project. Therefore, a qualitative analysis is appropriate for assessing air quality impacts from the operation of the project. The AADT collected for the project is below 150,000, as shown above in Table 8-4, indicating that the project will not be a project of air quality concern to the surrounding area.

Further, emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce annual MSAT emissions by 72 percent between 1999 and 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

This study includes a basic analysis of the likely MSAT emission impacts of this project. However, available technical tools do not enable us to predict the project-specific health impacts of the emission changes associated with the alternatives in this proposed project. Due to these limitations, a discussion is included, in Appendix C, in accordance with CEQ regulations (40 CFR 1502.22(b)) regarding incomplete or unavailable information.

8.4.5. Climate Change Quantiative Analysis

A quantitative analysis estimating CO_2 emissions for existing, 2012, and 2035 conditions was performed using Caltrans' CT-EMFAC. Inputs used to estimate CO_2 emissions were peak and off peak total VMT, vehicle mix, and VMT distribution by speed. CO_2 emissions are expected to increase from existing conditions to 2035 conditions due to increases in total VMT, as shown in Table 8-5. Furthermore, CO_2 concentrations are expected to remain the same for no build and conditions due to the similar VMT between the two alternatives. The additional right-turn lane is not expected to create an increase in VMT to the intersection, therefore, the project is not expected to cause a significant impact to the surrounding area.

Table 8-5. Maximum CO_2 Emissions[1]

Pollutant	Existing	2012	2035
CO_2 Emissions	18.6	19.2	28.9

Notes:
(1) CO_2 emissions are measured in tons.
Source: Entech Consulting Group, 2011

8.4.6. Odors

The operation of the project will not be a significant source of offensive orders. Any odors generated from the corridor after implementation of the project will be similar in nature to odors that would be generated from the corridor in the absence of the project. A site visit determined that there were no unusual or objectionable odors detected from nearby on-site or off-site land uses. Therefore, the project is not anticipated to cause or substantially contribute to odor impacts.

8.4.7. Cumulative Impacts

Operational emissions associated with the project are not expected to increase emissions from mobile sources and would provide an air quality benefit in the Basin. Furthermore, implementation of the project, along with other projects included in the regional RTP and Interim FTIP, should further improve traffic flow and decrease congestion within the region.

Chapter 9. Short-Term Construction Impacts

Construction activities associated with the proposed project would be temporary and would last the duration of project construction, approximately 6 months, beginning and ending in 2012. A qualitative construction emissions analysis was performed and has concluded that project construction would not create adverse pollutant emissions. Short-term impacts to air quality would occur during minor demolition, grading/trenching, new pavement construction and the restriping phase. Additional sources of construction related emissions include:

- Exhaust emissions and potential odors from construction equipment used on the construction site as well as the vehicles used to transport materials to and from the site; and
- Exhaust emissions from the motor vehicles of the construction crew.

Project construction would result in temporary air pollutant emissions of CO, NO_x, ROG, and PM_{10}. It is assumed that stationary or mobile powered on-site construction equipment will include trucks, tractors, signal boards, excavators, backhoes, concrete saws, crushing and/or processing equipment, graders, trenchers, pavers and other paving equipment. Based on the insignificant amount of daily work trips required for project construction, construction worker trips are not anticipated to significantly contribute to or affect traffic flow on local roadways and are therefore not considered significant. During the demolition phase some asphalt concrete (AC) pavement and curbs and gutters would have to be removed.

In order to further minimize construction-related emissions, all construction vehicles and construction equipment would be required to be equipped with the state-mandated emission control devices pursuant to state emission regulations and standard construction practices. After construction of the project is complete, all construction-related impacts would cease, thus resulting in a less than significant impact. Short-term construction PM_{10} emissions would be further reduced with the implementation of required dust suppression measures outlined within SCAQMD Rule 403. The Caltrans Standard Specifications for construction (Section 10 and 18 [Dust Control] and Section 39-3.06 [Asphalt Concrete Plants]) must also be adhered to. Therefore, Project construction is not anticipated to violate State or Federal air quality standards or contribute to the existing air quality violation in the air basin.

Chapter 10. Avoidance and Mitigation Measures

After a detailed analysis, it has been determined that air quality impacts created from the construction and operation of the project are minimal, thus no mitigation measures are required. However, Caltrans' Standard Specifications pertaining to dust control and dust palliative requirement is required to be a part of all construction contracts and should effectively reduce and control emission impacts during construction. The provisions of the Caltrans' Standard Specifications, Section 7-1.0F "Air Pollution Control" and Section 10 "Dust Control" require the contractor to comply with the SCAQMD rules, ordinances, and regulations.

The prime concern during construction is to mitigate PM_{10} emissions that occur from earth movement such as grading. SCAQMD has established Rule 403 that addresses the mitigation PM_{10} by reducing the ambient entrainment of fugitive dust and Rule 402 which requires that air pollutant emissions not be a nuisance off-site. Fugitive dust consists of solid particulate matters that becomes airborne due to human activity (i.e. construction) and is a subset of total suspended particulates. PM_{10} is a subset of total suspended particulates. The *Handbook* states that 50 percent of total particulate matter suspended comprise of PM_{10}. Therefore, in mitigating for fugitive dust, emissions of geologic PM_{10} are reduced.

During construction of the proposed project, the property owner/development and its contractors shall be required to comply with regional rules, which would assist in reducing short-term air pollutant emissions. Rule 403 requires that "No person conducting active operations without utilizing the applicable best available control measures included in Table 1 of this Rule to minimize Fugitive dust emissions from each fugitive dust source type within the active operation."

Rule 403 also requires that the construction activities "shall not cause or allow PM_{10} levels exceed 50 micrograms per cubic meter when determined by simultaneous sampling, as the difference between upwind and downwind sample." Large Projects that cannot meet this performance standard are required to implement the applicable actions specified in Table 3 of Rule 403. Rather than perform monitoring to determine conformance with the performance standard, which will not reduce PM_{10} emissions, the project shall implement all applicable measures presented in Rule 403 Table 3 regardless of conformance with the Rule 403 performance standard. This potentially results in a higher reduction of particulate emissions than if these measures were implemented only after being determined to be required by monitoring. The BACMs are shown in Table 10-1.

Further, Rule 403 requires that that the project shall not "allow track-out to extend 25 feet or more in cumulative length from the point of origin from an active operation." All track-out from an active operation is required to be removed at the conclusion of each workday or evening shift.

Table 10-1. Best Available Control Measures

Source Category	Control Measure	Guidance
Backfilling	01-1 Stabilize backfill material when not actively handling; and 01-2 Stabilize backfill material during handling; and 01-3 Stabilize soil at completion of activity.	1. Mix backfill soil with water prior to moving 2. Dedicate water truck or high capacity hose to backfilling equipment 3. Empty loader bucket slowly so that no dust plumes are generated 4. Minimize drop height from loader bucket
Clearing and Grubbing	02-1 Maintain stability of soil through pre-watering of site prior to clearing and grubbing; and 02-2 Stabilize soil during clearing and grubbing activities; and 02-3 Stabilize soil immediately after clearing and grubbing activities.	1. Maintain live perennial vegetation where possible 2. Apply water in sufficient quantity to prevent generation of dust plumes
Clearing Forms	03-1 Use water spray to clear forms; or 03-2 Use sweeping and water spray to clear forms; or 03-3 Use vacuum system to clear forms.	1. Use of high pressure air to clear forms may cause exceedance of Rule requirements
Crushing	04-1 Stabilize surface soils prior to operation of support equipment; and 04-2 Stabilize material after crushing.	1. Follow permit conditions for crushing equipment 2. Pre-water material prior to loading into crusher 3. Monitor crusher emissions opacity 4. Apply water to crushed material to prevent dust plumes
Cut and Fill	05-1 Pre-water soils prior to cut and fill activities; and 05-2 Stabilize soil during and after cut and fill activities.	1. For large sites, pre-water with sprinklers or water trucks and allow time for penetration 2. Use water trucks/pulls to water soils to depth of cut prior to subsequent cuts
Demolition - Mechanical/Manual	06-1 Stabilize wind erodible surfaces to reduce dust; and 06-2 Stabilize surface soil where support equipment and vehicles will operate; and 06-3 Stabilize loose soil and demolition debris; and 06-4 Comply with AQMD Rule 1403.	1. Apply water in sufficient quantities to prevent the generation of visible dust plumes
Disturbed Soil	07-1 Stabilize disturbed soil throughout the construction site; and 07-2 Stabilize disturbed soil between structures	1. Limit vehicular traffic and disturbances on soils where possible 2. If interior block walls are planned, install as early as possible 3. Apply water or a stabilizing agent in sufficient quantities to prevent the generation of visible dust plumes
Earth-Moving Activities	08-1 Pre-apply water to depth of proposed cuts; and 08-2 Re-apply water as necessary to maintain soils in a damp condition and to ensure that visible emissions do not exceed 100 feet in any direction; and 08-3 Stabilize soils once earth-moving activities are complete.	1. Grade each project phase separately, timed to coincide with construction phase 2. Upwind fencing can prevent material movement on site 3. Apply water or a stabilizing agent in sufficient quantities to prevent the generation of visible dust plumes

Table 10-1. Best Available Control Measures

Source Category	Control Measure	Guidance
Importing/Exporting of Bulk Materials	09-1 Stabilize material while loading to reduce fugitive dust emissions; and 09-2 Maintain at least six inches of freeboard on haul vehicles; and 09-3 Stabilize material while transporting to reduce fugitive dust emissions; and 09-4 Stabilize material while unloading to reduce fugitive dust emissions; and 09-5 Comply with Vehicle Code Section 23114.	1. Use tarps or other suitable enclosures on haul trucks 2. Check belly-dump truck seals regularly and remove any trapped rocks to prevent spillage 3. Comply with track-out prevention/mitigation requirements 4. Provide water while loading and unloading to reduce visible dust plumes
Landscaping	10-1 Stabilize soils, materials, slopes	1. Apply water to materials to stabilize 2. Maintain materials in a crusted condition 3. Maintain effective cover over materials 4. Stabilize sloping surfaces using soil binders until vegetation or ground cover can effectively stabilize the slopes 5. Hydroseed prior to rain season
Road Shoulder Maintenance	11-1 Apply water to unpaved shoulders prior to clearing; and 11-2 Apply chemical dust suppressants and/or washed gravel to maintain a stabilized surface after completing road shoulder maintenance.	1. Installation of curbing and/or paving of road shoulders can reduce recurring maintenance costs 2. Use of chemical dust suppressants can inhibit vegetation growth and reduce future road shoulder maintenance costs
Screening	12-1 Pre-water material prior to screening; and 12-2 Limit fugitive dust emissions to opacity and plume length standards; and 12-3 Stabilize material immediately after screening.	1. Dedicate water truck or high capacity hose to screening operation 2. Drop material through the screen slowly and minimize drop height 3. Install wind barrier with a porosity of no more than 50% upwind of screen to the height of the drop point
Staging Areas	13-1 Stabilize staging areas during use; and 13-2 Stabilize staging area soils at project completion.	1. Limit size of staging area 2. Limit vehicle speeds to 15 miles per hour 3. Limit number and size of staging area entrances/exists
Stockpiles/Bulk Material Handling	14-1 Stabilize stockpiled materials. 14-2 Stockpiles within 100 yards of off-site occupied buildings must not be greater than eight feet in height; or must have a road bladed to the top to allow water truck access or must have an operational water irrigation system that is capable of complete stockpile coverage.	1. Add or remove material from the downwind portion of the storage pile 2. Maintain storage piles to avoid steep sides or faces
Traffic Areas for Construction Acitivities	15-1 Stabilize all off-road traffic and parking areas; and 15-2 Stabilize all haul routes; and 15-3 Direct construction traffic over established haul routes.	1. Apply gravel/paving to all haul routes as soon as possible to all future roadway areas 2. Barriers can be used to ensure vehicles are only used on established parking areas/haul routes

Table 10-1. Best Available Control Measures

Source Category	Control Measure	Guidance
Trenching	16-1 Stabilize surface soils where trencher or excavator and support equipment will operate; and 16-2 Stabilize soils at the completion of trenching activities.	1. Pre-watering of soils prior to trenching is an effective preventive measure. For deep trenching activities, pre-trench to 18 inches soak soils via the pre-trench and resuming trenching 2. Washing mud and soils from equipment at the conclusion of trenching activities can prevent crusting and drying of soil on equipment
Truck Loading	17-1 Pre-water material prior to loading; and 17-2 Ensure that freeboard exceeds six inches (CVC 23114)	1. Empty loader bucket such that no visible dust plumes are created 2. Ensure that the loader bucket is close to the truck to minimize drop height while loading
Turf Overseeding	18-1 Apply sufficient water immediately prior to conducting turf vacuuming activities to meet opacity and plume length standards; and 18-2 Cover haul vehicles prior to exiting the site.	1. Haul waste material immediately off-site
Unpaved Road/Parking Lots	19-1 Stabilize soils to meet the applicable performance standards; and 19-2 Limit vehicular travel to established unpaved roads (haul routes) and unpaved parking lots.	1. Restricting vehicular access to established unpaved travel paths and parking lots can reduce stabilization requirements
Vacant Land	20-1 In instances where vacant lots are 0.10 acre or larger and have a cumulative area of 500 square feet or more that are driven over and/or used by motor vehicles and/or off-road vehicles, prevent motor vehicle and/or off-road vehicle trespassing, parking and/or access by installing barriers, curbs, fences, gates, posts, signs, shrubs, trees or other effective control measures.	

Source: SCAQMD website, http://aqmd.gov/rules/download.html

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Appendix A Summary of EMFAC 2007 Model Results

Title : Vista Chino & Farrell Drive_Existing
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2011/01/24 15:56:08
Scen Year: 2010 -- All model years in the range 1966 to 2010 selected
Season : Winter
Area : Riverside
****

Year: 2010 -- Model Years 1966 to 2010 Inclusive -- Winter
Emfac2007 Emission Factors: V2.3 Nov 1 2006

County Average Riverside County Average

Table 1: Running Exhaust Emissions (grams/mile; grams/idle-hour)
Pollutant Name: Carbon Monoxide Temperature: 80F Relative Humidity: 25%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
0	0.000	0.000	20.413	58.909	0.000	0.000	7.237
1	4.958	7.188	7.397	19.554	51.913	31.243	7.395
5	4.584	6.606	6.878	19.554	51.913	31.243	6.966
10	3.981	5.669	5.649	13.901	34.318	25.950	5.736
15	3.519	4.965	4.797	9.981	23.989	22.586	4.849
20	3.153	4.420	4.181	7.509	17.731	20.580	4.215
25	2.859	3.989	3.723	6.220	13.856	19.628	3.772
30	2.619	3.645	3.375	5.241	11.447	19.604	3.430
35	2.424	3.371	3.111	4.509	9.997	20.530	3.171
40	2.266	3.156	2.914	3.987	9.230	22.581	2.985
45	2.142	2.994	2.778	3.659	9.008	26.133	2.871
50	2.052	2.886	2.702	3.519	9.292	31.875	2.834
55	2.000	2.836	2.694	3.572	10.133	41.027	2.893
60	1.992	2.857	2.770	3.836	11.679	55.763	3.082
65	2.045	2.976	2.964	4.347	14.228	80.049	3.465

Title : Vista Chino & Farrell Drive_2012
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2011/01/24 16:01:44
Scen Year: 2012 -- All model years in the range 1968 to 2012 selected
Season : Winter
Area : Riverside
****

Year: 2012 -- Model Years 1968 to 2012 Inclusive -- Winter
Emfac2007 Emission Factors: V2.3 Nov 1 2006

County Average Riverside County Average

Table 1: Running Exhaust Emissions (grams/mile; grams/idle-hour)
Pollutant Name: Carbon Monoxide Temperature: 80F Relative Humidity: 25%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
0	0.000	0.000	19.887	57.359	0.000	0.000	7.199
1	3.942	5.998	6.370	16.404	49.195	28.371	6.183
5	3.670	5.541	5.938	16.404	49.195	28.371	5.853
10	3.221	4.798	4.935	11.454	32.517	23.729	4.833
15	2.868	4.229	4.228	8.067	22.727	20.739	4.095
20	2.583	3.780	3.709	6.017	16.796	18.915	3.569
25	2.349	3.421	3.316	5.014	13.124	17.998	3.205
30	2.155	3.130	3.013	4.259	10.842	17.879	2.920
35	1.993	2.893	2.778	3.702	9.468	18.576	2.702
40	1.859	2.703	2.598	3.313	8.741	20.236	2.543
45	1.750	2.555	2.468	3.078	8.530	23.177	2.441
50	1.665	2.449	2.387	2.993	8.800	27.981	2.402
55	1.606	2.387	2.360	3.062	9.595	35.682	2.439
60	1.578	2.378	2.401	3.299	11.059	48.123	2.580
65	1.588	2.439	2.534	3.733	13.474	68.666	2.875

Title : Vista Chino & Farrell Drive_2035
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2011/01/24 16:01:09
Scen Year: 2035 -- All model years in the range 1991 to 2035 selected
Season : Winter
Area : Riverside
****

Year: 2035 -- Model Years 1991 to 2035 Inclusive -- Winter
Emfac2007 Emission Factors: V2.3 Nov 1 2006

County Average Riverside County Average

Table 1: Running Exhaust Emissions (grams/mile; grams/idle-hour)
Pollutant Name: Carbon Monoxide Temperature: 80F Relative Humidity: 25%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
0	0.000	0.000	14.715	52.056	0.000	0.000	7.435
1	1.020	1.735	2.303	5.390	30.988	22.325	2.056
5	0.972	1.654	2.203	5.390	30.988	22.325	1.995
10	0.886	1.506	1.968	3.355	20.536	19.082	1.639
15	0.810	1.375	1.775	2.077	14.386	16.892	1.387
20	0.742	1.260	1.612	1.483	10.653	15.451	1.224
25	0.682	1.158	1.473	1.312	8.338	14.597	1.120
30	0.629	1.067	1.353	1.202	6.898	14.261	1.036
35	0.581	0.986	1.249	1.140	6.031	14.449	0.968
40	0.539	0.914	1.157	1.115	5.574	15.247	0.916
45	0.501	0.849	1.076	1.123	5.443	16.846	0.879
50	0.467	0.792	1.006	1.162	5.618	19.599	0.859
55	0.436	0.740	0.944	1.234	6.129	24.132	0.859
60	0.409	0.694	0.891	1.343	7.065	31.565	0.887
65	0.384	0.653	0.847	1.498	8.608	43.942	0.959

Appendix B Summary of CT-EMFAC Model Results

Title : Vista Chino & Farrell Drive_Existing
Version : CT-EMFAC 2.6
Run Date : 28 January 2011 03:58 PM
Scen Year : 2011
Season : Annual
Temperature : 70F
Relative Humidity : 49%
Area : Riverside County

Peak User Input :

Total VMT	Volume (vph)	Road Length(mi)	Number of Hours
20210			

VMT Distribution(%) by Speed(mph)

(mph)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	>75
%	0.06	0.14	0.52	1.86	3.62	9.19	9.86	7.05	5.14	13.52	2.33	1.00	26.14	17.14	2.43

Offpeak User Input:

Total VMT	Volume (vph)	Road Length(mi)	Number of Hours
12126			

VMT Distribution(%) by Speed(mph)

(mph)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	>75
%	0.06	0.14	0.52	1.86	3.62	9.19	9.86	7.05	5.14	13.52	2.33	1.00	26.14	17.14	2.43

==

Running Exhaust Emissions (grams)

Pollutant Name : TOG_exh

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	1.160000	19.40	0.06	22.505856
10	0.711000	45.27	0.14	32.187254
15	0.425000	168.15	0.52	71.462560
20	0.284000	601.45	1.86	170.811686
25	0.228000	1,170.56	3.62	266.888410
30	0.189000	2,971.68	9.19	561.647218
35	0.164000	3,188.33	9.86	522.886054
40	0.149000	2,279.69	7.05	339.673512
45	0.143000	1,662.07	5.14	237.676067
50	0.146000	4,371.83	13.52	638.286771
55	0.158000	753.43	2.33	119.041750
60	0.181000	323.36	1.00	58.528160
65	0.218000	8,452.63	26.14	1,842.673427
70	0.256000	5,542.39	17.14	1,418.851942
75	0.311000	785.76	2.43	244.372853
Total		32,336.00	100.00	6,547.493522

Pollutant Name : SO2

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.013000	19.40	0.06	0.252221
10	0.010000	45.27	0.14	0.452704
15	0.008000	168.15	0.52	1.345178
20	0.006000	601.45	1.86	3.608698
25	0.006000	1,170.56	3.62	7.023379
30	0.005000	2,971.68	9.19	14.858392
35	0.005000	3,188.33	9.86	15.941648
40	0.004000	2,279.69	7.05	9.118752
45	0.004000	1,662.07	5.14	6.648282
50	0.004000	4,371.83	13.52	17.487309
55	0.004000	753.43	2.33	3.013715
60	0.005000	323.36	1.00	1.616800
65	0.005000	8,452.63	26.14	42.263152
70	0.005000	5,542.39	17.14	27.711952
75	0.006000	785.76	2.43	4.714589
Total		32,336.00	100.00	156.056770

Pollutant Name : Diesel_PM

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.132005	19.40	0.06	2.561108
10	0.090780	45.27	0.14	4.109647
15	0.060605	168.15	0.52	10.190561
20	0.043095	601.45	1.86	25.919471
25	0.036210	1,170.56	3.62	42.386093
30	0.031195	2,971.68	9.19	92.701508
35	0.027965	3,188.33	9.86	89.161637
40	0.026435	2,279.69	7.05	60.263552
45	0.026520	1,662.07	5.14	44.078107
50	0.028390	4,371.83	13.52	124.116174
55	0.031875	753.43	2.33	24.015543
60	0.037060	323.36	1.00	11.983722
65	0.043860	8,452.63	26.14	370.732369
70	0.052360	5,542.39	17.14	290.199561
75	0.062560	785.76	2.43	49.157446

Total		32,336.00	100.00	1,241.576500

Pollutant Name : PM2.5

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.196000	19.40	0.06	3.802714
10	0.132000	45.27	0.14	5.975693
15	0.089000	168.15	0.52	14.965101
20	0.064000	601.45	1.86	38.492774
25	0.052000	1,170.56	3.62	60.869286
30	0.044000	2,971.68	9.19	130.753850
35	0.038000	3,188.33	9.86	121.156525
40	0.036000	2,279.69	7.05	82.068768
45	0.035000	1,662.07	5.14	58.172464
50	0.037000	4,371.83	13.52	161.757606
55	0.040000	753.43	2.33	30.137152
60	0.046000	323.36	1.00	14.874560
65	0.054000	8,452.63	26.14	456.442042
70	0.062000	5,542.39	17.14	343.628205
75	0.072000	785.76	2.43	56.575066

Total		32,336.00	100.00	1,579.671805

Pollutant Name : PM10

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.212000	19.40	0.06	4.113139
10	0.143000	45.27	0.14	6.473667
15	0.097000	168.15	0.52	16.310278
20	0.069000	601.45	1.86	41.500022
25	0.056000	1,170.56	3.62	65.551539
30	0.047000	2,971.68	9.19	139.668885
35	0.042000	3,188.33	9.86	133.909843
40	0.039000	2,279.69	7.05	88.907832
45	0.038000	1,662.07	5.14	63.158675
50	0.040000	4,371.83	13.52	174.873088
55	0.044000	753.43	2.33	33.150867
60	0.050000	323.36	1.00	16.168000
65	0.059000	8,452.63	26.14	498.705194
70	0.068000	5,542.39	17.14	376.882547
75	0.079000	785.76	2.43	62.075419

Total		32,336.00	100.00	1,721.448997

Pollutant Name : NOX

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	2.589000	19.40	0.06	50.230742
10	1.891000	45.27	0.14	85.606326
15	1.452000	168.15	0.52	244.149734
20	1.263000	601.45	1.86	759.630845
25	1.195000	1,170.56	3.62	1,398.823024
30	1.146000	2,971.68	9.19	3,405.543446
35	1.113000	3,188.33	9.86	3,548.610845
40	1.096000	2,279.69	7.05	2,498.538048
45	1.095000	1,662.07	5.14	1,819.967088
50	1.111000	4,371.83	13.52	4,857.100019
55	1.145000	753.43	2.33	862.675976
60	1.200000	323.36	1.00	388.032000
65	1.281000	8,452.63	26.14	10,827.819542
70	1.372000	5,542.39	17.14	7,604.159629
75	1.499000	785.76	2.43	1,177.861435

Total		32,336.00	100.00	39,528.748701

Pollutant Name : FORMALDEHYDE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.107656	19.40	0.06	2.088699
10	0.061478	45.27	0.14	2.783134
15	0.031421	168.15	0.52	5.283353
20	0.018141	601.45	1.86	10.910897
25	0.014690	1,170.56	3.62	17.195573
30	0.012073	2,971.68	9.19	35.877073
35	0.010183	3,188.33	9.86	32.466760
40	0.008979	2,279.69	7.05	20.469319
45	0.008436	1,662.07	5.14	14.021226
50	0.008541	4,371.83	13.52	37.339776
55	0.009305	753.43	2.33	7.010655
60	0.010776	323.36	1.00	3.484527
65	0.013005	8,452.63	26.14	109.926458
70	0.015798	5,542.39	17.14	87.558684
75	0.019514	785.76	2.43	15.333414

Total		32,336.00	100.00	401.749549

Pollutant Name : CO2

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	1,333.840000	19.40	0.06	25,878.630144
10	1,022.107000	45.27	0.14	46,271.192733
15	809.611000	168.15	0.52	136,133.822739
20	665.457000	601.45	1.86	400,238.846467
25	576.559000	1,170.56	3.62	674,898.748029
30	515.852000	2,971.68	9.19	1,532,946.245997
35	475.973000	3,188.33	9.86	1,517,558.804701
40	452.558000	2,279.69	7.05	1,031,691.041904
45	443.287000	1,662.07	5.14	736,774.201405
50	447.393000	4,371.83	13.52	1,955,924.886490
55	465.514000	753.43	2.33	350,731.654403
60	499.820000	323.36	1.00	161,621.795200
65	554.476000	8,452.63	26.14	4,686,780.693670
70	563.767000	5,542.39	17.14	3,124,616.808637
75	577.746000	785.76	2.43	453,972.470141

Total		32,336.00	100.00	16,836,039.842659

Pollutant Name : BUTADIENE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.004117	19.40	0.06	0.079876
10	0.002669	45.27	0.14	0.120827
15	0.001763	168.15	0.52	0.296444
20	0.001271	601.45	1.86	0.764442
25	0.001022	1,170.56	3.62	1.196316
30	0.000859	2,971.68	9.19	2.552672
35	0.000756	3,188.33	9.86	2.410377
40	0.000703	2,279.69	7.05	1.602621
45	0.000686	1,662.07	5.14	1.140180
50	0.000710	4,371.83	13.52	3.103997
55	0.000776	753.43	2.33	0.584661
60	0.000895	323.36	1.00	0.289407
65	0.001086	8,452.63	26.14	9.179557
70	0.001285	5,542.39	17.14	7.121972
75	0.001595	785.76	2.43	1.253295
Total		32,336.00	100.00	31.696643

Pollutant Name : BENZENE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.025802	19.40	0.06	0.500600
10	0.016025	45.27	0.14	0.725458
15	0.009813	168.15	0.52	1.650028
20	0.006691	601.45	1.86	4.024299
25	0.005382	1,170.56	3.62	6.299971
30	0.004495	2,971.68	9.19	13.357694
35	0.003914	3,188.33	9.86	12.479122
40	0.003592	2,279.69	7.05	8.188639
45	0.003476	1,662.07	5.14	5.777357
50	0.003573	4,371.83	13.52	15.620539
55	0.003898	753.43	2.33	2.936865
60	0.004491	323.36	1.00	1.452210
65	0.005435	8,452.63	26.14	45.940046
70	0.006438	5,542.39	17.14	35.681909
75	0.007949	785.76	2.43	6.246044
Total		32,336.00	100.00	160.880783

Pollutant Name : ACROLEIN

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.000667	19.40	0.06	0.012941
10	0.000458	45.27	0.14	0.020734
15	0.000331	168.15	0.52	0.055657
20	0.000253	601.45	1.86	0.152167
25	0.000203	1,170.56	3.62	0.237624
30	0.000171	2,971.68	9.19	0.508157
35	0.000152	3,188.33	9.86	0.484626
40	0.000142	2,279.69	7.05	0.323716
45	0.000140	1,662.07	5.14	0.232690
50	0.000145	4,371.83	13.52	0.633915
55	0.000159	753.43	2.33	0.119795
60	0.000182	323.36	1.00	0.058852
65	0.000221	8,452.63	26.14	1.868031
70	0.000259	5,542.39	17.14	1.435479
75	0.000321	785.76	2.43	0.252231
Total		32,336.00	100.00	6.396614

Pollutant Name : ACETALDEHYDE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.051465	19.40	0.06	0.998503
10	0.029124	45.27	0.14	1.318455
15	0.014549	168.15	0.52	2.446374
20	0.008190	601.45	1.86	4.925872
25	0.006641	1,170.56	3.62	7.773710
30	0.005445	2,971.68	9.19	16.180789
35	0.004569	3,188.33	9.86	14.567478
40	0.004002	2,279.69	7.05	9.123311
45	0.003741	1,662.07	5.14	6.217805
50	0.003779	4,371.83	13.52	16.521135
55	0.004118	753.43	2.33	3.102620
60	0.004777	323.36	1.00	1.544691
65	0.005765	8,452.63	26.14	48.729414
70	0.007045	5,542.39	17.14	39.046140
75	0.008715	785.76	2.43	6.847940
Total		32,336.00	100.00	179.344238

Idling Emissions (grams) (Currently NOT Available)

Evaporative Running Loss Emissions (grams)

Pollutant Name : TOG_los

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.034000	706.81	1,441.890926

Pollutant Name : FORMALDEHYDE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000000	706.81	0.000000

Pollutant Name : BUTADIENE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000002	706.81	0.084817

Pollutant Name : BENZENE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000333	706.81	14.122049

Pollutant Name : ACROLEIN

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000000	706.81	0.000000

Pollutant Name : ACETALDEHYDE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000000	706.81	0.000000

Total Emissions

Pollutant Name	Total Emissions (grams)	Total Emissions (Kilograms)	Total Emissions (US Tons)
TOG	7,989.384447	7.989384	0.008806789
SO2	156.056770	0.156057	0.000172023
Diesel_PM	1,241.576500	1.241576	0.001368604
PM2.5	1,579.671805	1.579672	0.001741290
PM10	1,721.448997	1.721449	0.001897573
NOX	39,528.748701	39.528749	0.043572987
FORMALDEHYDE	401.749549	0.401750	0.000442853
CO2	16,836,039.842659	16,836.039843	18.558557150
BUTADIENE	31.781460	0.031781	0.000035033
BENZENE	175.002833	0.175003	0.000192908
ACROLEIN	6.396614	0.006397	0.000007051
ACETALDEHYDE	179.344238	0.179344	0.000197693

-- END--

Title : Vista Chino & Farrell Drive_2012
Version : CT-EMFAC 2.6
Run Date : 28 January 2011 04:02 PM
Scen Year : 2012
Season : Annual
Temperature : 70F
Relative Humidity : 49%
Area : Riverside County

Peak User Input :
Total VMT Volume (vph) Road Length(mi) Number of Hours
20825
VMT Distribution(%) by Speed(mph)
(mph) 5 10 15 20 25 30 35 40 45 50 55 60 65 70 >75
% 0.03 0.19 0.44 1.43 3.08 8.01 10.12 7.32 5.11 11.91 1.72 1.72 30.45 17.14 1.33
Offpeak User Input:
Total VMT Volume (vph) Road Length(mi) Number of Hours
12495
VMT Distribution(%) by Speed(mph)
(mph) 5 10 15 20 25 30 35 40 45 50 55 60 65 70 >75
% 0.03 0.19 0.44 1.43 3.08 8.01 10.12 7.32 5.11 11.91 1.72 1.72 30.45 17.14 1.33

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Running Exhaust Emissions (grams)

Pollutant Name : TOG_exh

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	1.067000	10.00	0.03	10.665732
10	0.652000	63.31	0.19	41.276816
15	0.389000	146.61	0.44	57.030512
20	0.260000	476.48	1.43	123.883760
25	0.209000	1,026.26	3.08	214.487504
30	0.174000	2,668.93	8.01	464.394168
35	0.150000	3,371.98	10.12	505.797600
40	0.137000	2,439.02	7.32	334.146288
45	0.131000	1,702.65	5.11	223.047412
50	0.134000	3,968.41	11.91	531.767208
55	0.145000	573.10	1.72	83.100080
60	0.167000	573.10	1.72	95.708368
65	0.200000	10,145.94	30.45	2,029.188000
70	0.236000	5,711.05	17.14	1,347.807328
75	0.289000	443.16	1.33	128.072084
Total		33,320.00	100.00	6,190.372860

Pollutant Name : SO2

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.013000	10.00	0.03	0.129948
10	0.010000	63.31	0.19	0.633080
15	0.008000	146.61	0.44	1.172864
20	0.006000	476.48	1.43	2.858856
25	0.006000	1,026.26	3.08	6.157536
30	0.005000	2,668.93	8.01	13.344660
35	0.005000	3,371.98	10.12	16.859920
40	0.004000	2,439.02	7.32	9.756096
45	0.004000	1,702.65	5.11	6.810608
50	0.004000	3,968.41	11.91	15.873648
55	0.005000	573.10	1.72	2.865520
60	0.005000	573.10	1.72	2.865520
65	0.005000	10,145.94	30.45	50.729700
70	0.005000	5,711.05	17.14	28.555240
75	0.006000	443.16	1.33	2.658936
Total		33,320.00	100.00	161.272132

Pollutant Name : Diesel_PM

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.116702	10.00	0.03	1.166553
10	0.080410	63.31	0.19	5.090596
15	0.053922	146.61	0.44	7.905397
20	0.038528	476.48	1.43	18.357667
25	0.032508	1,026.26	3.08	33.361530
30	0.028122	2,668.93	8.01	75.055706
35	0.025370	3,371.98	10.12	85.547234
40	0.024166	2,439.02	7.32	58.941454
45	0.024424	1,702.65	5.11	41.585572
50	0.026230	3,968.41	11.91	104.091447
55	0.029584	573.10	1.72	16.954709
60	0.034400	573.10	1.72	19.714778
65	0.040764	10,145.94	30.45	413.589098
70	0.048590	5,711.05	17.14	277.499822
75	0.057964	443.16	1.33	25.687094

Total		33,320.00	100.00	1,184.548658

Pollutant Name : PM2.5

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.183000	10.00	0.03	1.829268
10	0.123000	63.31	0.19	7.786884
15	0.083000	146.61	0.44	12.168464
20	0.060000	476.48	1.43	28.588560
25	0.049000	1,026.26	3.08	50.286544
30	0.041000	2,668.93	8.01	109.426212
35	0.036000	3,371.98	10.12	121.391424
40	0.034000	2,439.02	7.32	82.926816
45	0.033000	1,702.65	5.11	56.187516
50	0.035000	3,968.41	11.91	138.894420
55	0.038000	573.10	1.72	21.777952
60	0.044000	573.10	1.72	25.216576
65	0.052000	10,145.94	30.45	527.588880
70	0.059000	5,711.05	17.14	336.951832
75	0.068000	443.16	1.33	30.134608

Total		33,320.00	100.00	1,551.155956

Pollutant Name : PM10

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.198000	10.00	0.03	1.979208
10	0.133000	63.31	0.19	8.419964
15	0.090000	146.61	0.44	13.194720
20	0.065000	476.48	1.43	30.970940
25	0.053000	1,026.26	3.08	54.391568
30	0.044000	2,668.93	8.01	117.433008
35	0.039000	3,371.98	10.12	131.507376
40	0.036000	2,439.02	7.32	87.804864
45	0.036000	1,702.65	5.11	61.295472
50	0.038000	3,968.41	11.91	150.799656
55	0.042000	573.10	1.72	24.070368
60	0.048000	573.10	1.72	27.508992
65	0.056000	10,145.94	30.45	568.172640
70	0.064000	5,711.05	17.14	365.507072
75	0.074000	443.16	1.33	32.793544

Total		33,320.00	100.00	1,675.849392

Pollutant Name : NOX

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	2.358000	10.00	0.03	23.570568
10	1.728000	63.31	0.19	109.396224
15	1.328000	146.61	0.44	194.695424
20	1.153000	476.48	1.43	549.376828
25	1.089000	1,026.26	3.08	1,117.592784
30	1.041000	2,668.93	8.01	2,778.358212
35	1.009000	3,371.98	10.12	3,402.331856
40	0.992000	2,439.02	7.32	2,419.511808
45	0.990000	1,702.65	5.11	1,685.625480
50	1.004000	3,968.41	11.91	3,984.285648
55	1.034000	573.10	1.72	592.589536
60	1.083000	573.10	1.72	620.671632
65	1.157000	10,145.94	30.45	11,738.852580
70	1.240000	5,711.05	17.14	7,081.699520
75	1.357000	443.16	1.33	601.362692
Total		33,320.00	100.00	36,899.920792

Pollutant Name : FORMALDEHYDE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.099019	10.00	0.03	0.989794
10	0.056414	63.31	0.19	3.571458
15	0.028784	146.61	0.44	4.219965
20	0.016691	476.48	1.43	7.952861
25	0.013562	1,026.26	3.08	13.918084
30	0.011185	2,668.93	8.01	29.852004
35	0.009451	3,371.98	10.12	31.868621
40	0.008341	2,439.02	7.32	20.343899
45	0.007818	1,702.65	5.11	13.311333
50	0.007883	3,968.41	11.91	31.282992
55	0.008545	573.10	1.72	4.897174
60	0.009840	573.10	1.72	5.639343
65	0.011822	10,145.94	30.45	119.945303
70	0.014330	5,711.05	17.14	81.839318
75	0.017673	443.16	1.33	7.831896
Total		33,320.00	100.00	377.464044

Pollutant Name : CO2

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	1,338.091000	10.00	0.03	13,375.557636
10	1,025.634000	63.31	0.19	64,930.837272
15	812.479000	146.61	0.44	119,115.921232
20	667.835000	476.48	1.43	318,207.349460
25	578.811000	1,026.26	3.08	594,008.261616
30	517.985000	2,668.93	8.01	1,382,466.742020
35	478.001000	3,371.98	10.12	1,611,811.723984
40	454.501000	2,439.02	7.32	1,108,538.847024
45	445.168000	1,702.65	5.11	757,966.185536
50	449.236000	3,968.41	11.91	1,782,753.533232
55	467.343000	573.10	1.72	267,836.142672
60	501.660000	573.10	1.72	287,503.352640
65	556.349000	10,145.94	30.45	5,644,683.573060
70	565.751000	5,711.05	17.14	3,231,031.117048
75	579.883000	443.16	1.33	256,978.630748
Total		33,320.00	100.00	17,441,207.775180

Pollutant Name : BUTADIENE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.003763	10.00	0.03	0.037615
10	0.002438	63.31	0.19	0.154345
15	0.001612	146.61	0.44	0.236332
20	0.001163	476.48	1.43	0.554142
25	0.000938	1,026.26	3.08	0.962628
30	0.000791	2,668.93	8.01	2.111125
35	0.000697	3,371.98	10.12	2.350273
40	0.000648	2,439.02	7.32	1.580488
45	0.000634	1,702.65	5.11	1.079481
50	0.000659	3,968.41	11.91	2.615184
55	0.000720	573.10	1.72	0.412635
60	0.000833	573.10	1.72	0.477396
65	0.001013	10,145.94	30.45	10.277837
70	0.001203	5,711.05	17.14	6.870391
75	0.001500	443.16	1.33	0.664734

Total		33,320.00	100.00	30.384605

Pollutant Name : BENZENE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.023687	10.00	0.03	0.236775
10	0.014694	63.31	0.19	0.930248
15	0.009001	146.61	0.44	1.319619
20	0.006151	476.48	1.43	2.930804
25	0.004961	1,026.26	3.08	5.091256
30	0.004158	2,668.93	8.01	11.097419
35	0.003628	3,371.98	10.12	12.233558
40	0.003329	2,439.02	7.32	8.119511
45	0.003225	1,702.65	5.11	5.491053
50	0.003323	3,968.41	11.91	13.187033
55	0.003621	573.10	1.72	2.075210
60	0.004177	573.10	1.72	2.393855
65	0.005060	10,145.94	30.45	51.338456
70	0.006009	5,711.05	17.14	34.317687
75	0.007445	443.16	1.33	3.299296

Total		33,320.00	100.00	154.061781

Pollutant Name : ACROLEIN

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.000610	10.00	0.03	0.006098
10	0.000419	63.31	0.19	0.026526
15	0.000304	146.61	0.44	0.044569
20	0.000232	476.48	1.43	0.110542
25	0.000186	1,026.26	3.08	0.190884
30	0.000158	2,668.93	8.01	0.421691
35	0.000140	3,371.98	10.12	0.472078
40	0.000132	2,439.02	7.32	0.321951
45	0.000130	1,702.65	5.11	0.221345
50	0.000135	3,968.41	11.91	0.535736
55	0.000148	573.10	1.72	0.084819
60	0.000171	573.10	1.72	0.098001
65	0.000208	10,145.94	30.45	2.110356
70	0.000245	5,711.05	17.14	1.399207
75	0.000305	443.16	1.33	0.135163

Total		33,320.00	100.00	6.178964

Pollutant Name : ACETALDEHYDE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.047327	10.00	0.03	0.473081
10	0.026714	63.31	0.19	1.691210
15	0.013317	146.61	0.44	1.952379
20	0.007529	476.48	1.43	3.587388
25	0.006127	1,026.26	3.08	6.287871
30	0.005041	2,668.93	8.01	13.454086
35	0.004238	3,371.98	10.12	14.290468
40	0.003715	2,439.02	7.32	9.060974
45	0.003463	1,702.65	5.11	5.896284
50	0.003479	3,968.41	11.91	13.806105
55	0.003769	573.10	1.72	2.160029
60	0.004341	573.10	1.72	2.487844
65	0.005210	10,145.94	30.45	52.860347
70	0.006349	5,711.05	17.14	36.259444
75	0.007835	443.16	1.33	3.472127
Total		33,320.00	100.00	167.739637

Idling Emissions (grams) (Currently NOT Available)

Evaporative Running Loss Emissions (grams)

Pollutant Name : TOG_los

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.032000	710.02	1,363.245303

Pollutant Name : FORMALDEHYDE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000000	710.02	0.000000

Pollutant Name : BUTADIENE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000002	710.02	0.085203

Pollutant Name : BENZENE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000324	710.02	13.802859

Pollutant Name : ACROLEIN

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000000	710.02	0.000000

Pollutant Name : ACETALDEHYDE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000000	710.02	0.000000

Total Emissions

Pollutant Name	Total Emissions (grams)	Total Emissions (Kilograms)	Total Emissions (US Tons)
TOG	7,553.618163	7.553618	0.008326439
SO2	161.272132	0.161272	0.000177772
Diesel_PM	1,184.548658	1.184549	0.001305741
PM2.5	1,551.155956	1.551156	0.001709857
PM10	1,675.849392	1.675849	0.001847308
NOX	36,899.920792	36.899921	0.040675200
FORMALDEHYDE	377.464044	0.377464	0.000416083
CO2	17,441,207.775180	17,441.207775	19.225640607
BUTADIENE	30.469807	0.030470	0.000033587
BENZENE	167.864639	0.167865	0.000185039
ACROLEIN	6.178964	0.006179	0.000006811
ACETALDEHYDE	167.739637	0.167740	0.000184901

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Title : Vista Chino & Farrell Drive_2035
Version : CT-EMFAC 2.6
Run Date : 28 January 2011 04:08 PM
Scen Year : 2035
Season : Annual
Temperature : 70F
Relative Humidity : 49%
Area : Riverside County

Peak User Input :

Total VMT	Volume (vph)	Road Length(mi)	Number of Hours
29325			

VMT Distribution(%) by Speed(mph)

(mph)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	>75
%	0.05	0.18	0.4	1.31	1.41	2.78	7.32	10.13	7.85	7.02	11.34	2.4	1.34	30.86	15.61

Offpeak User Input:

Total VMT	Volume (vph)	Road Length(mi)	Number of Hours
17595			

VMT Distribution(%) by Speed(mph)

(mph)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	>75
%	0.05	0.18	0.4	1.31	1.41	2.78	7.32	10.13	7.85	7.02	11.34	2.4	1.34	30.86	15.61

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Running Exhaust Emissions (grams)

Pollutant Name : TOG_exh

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.364000	23.46	0.05	8.539440
10	0.217000	84.46	0.18	18.326952
15	0.127000	187.68	0.40	23.835360
20	0.086000	614.65	1.31	52.860072
25	0.072000	661.57	1.41	47.633184
30	0.062000	1,304.38	2.78	80.871312
35	0.055000	3,434.54	7.32	188.899920
40	0.050000	4,753.00	10.13	237.649800
45	0.048000	3,683.22	7.85	176.794560
50	0.048000	3,293.78	7.02	158.101632
55	0.051000	5,320.73	11.34	271.357128
60	0.056000	1,126.08	2.40	63.060480
65	0.067000	628.73	1.34	42.124776
70	0.080000	14,479.51	30.86	1,158.360960
75	0.102000	7,324.21	15.61	747.069624
Total		46,920.00	100.00	3,275.485200

Pollutant Name : SO2

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.014000	23.46	0.05	0.328440
10	0.011000	84.46	0.18	0.929016
15	0.008000	187.68	0.40	1.501440
20	0.007000	614.65	1.31	4.302564
25	0.006000	661.57	1.41	3.969432
30	0.005000	1,304.38	2.78	6.521880
35	0.005000	3,434.54	7.32	17.172720
40	0.005000	4,753.00	10.13	23.764980
45	0.005000	3,683.22	7.85	18.416100
50	0.005000	3,293.78	7.02	16.468920
55	0.005000	5,320.73	11.34	26.603640
60	0.005000	1,126.08	2.40	5.630400
65	0.006000	628.73	1.34	3.772368
70	0.006000	14,479.51	30.86	86.877072
75	0.006000	7,324.21	15.61	43.945272
Total		46,920.00	100.00	260.204244

Pollutant Name : Diesel_PM

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.011433	23.46	0.05	0.268218
10	0.009888	84.46	0.18	0.835101
15	0.008652	187.68	0.40	1.623807
20	0.007622	614.65	1.31	4.684878
25	0.007210	661.57	1.41	4.769934
30	0.007004	1,304.38	2.78	9.135850
35	0.007107	3,434.54	7.32	24.409304
40	0.007519	4,753.00	10.13	35.737777
45	0.008137	3,683.22	7.85	29.970361
50	0.009064	3,293.78	7.02	29.854858
55	0.010197	5,320.73	11.34	54.255463
60	0.011639	1,126.08	2.40	13.106445
65	0.013287	628.73	1.34	8.353909
70	0.015244	14,479.51	30.86	220.725681
75	0.017407	7,324.21	15.61	127.492558

Total		46,920.00	100.00	565.224145

Pollutant Name : PM2.5

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.096000	23.46	0.05	2.252160
10	0.065000	84.46	0.18	5.489640
15	0.046000	187.68	0.40	8.633280
20	0.034000	614.65	1.31	20.898168
25	0.027000	661.57	1.41	17.862444
30	0.023000	1,304.38	2.78	30.000648
35	0.021000	3,434.54	7.32	72.125424
40	0.019000	4,753.00	10.13	90.306924
45	0.019000	3,683.22	7.85	69.981180
50	0.020000	3,293.78	7.02	65.875680
55	0.022000	5,320.73	11.34	117.056016
60	0.024000	1,126.08	2.40	27.025920
65	0.028000	628.73	1.34	17.604384
70	0.030000	14,479.51	30.86	434.385360
75	0.032000	7,324.21	15.61	234.374784

Total		46,920.00	100.00	1,213.872012

Pollutant Name : PM10

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.104000	23.46	0.05	2.439840
10	0.070000	84.46	0.18	5.911920
15	0.049000	187.68	0.40	9.196320
20	0.037000	614.65	1.31	22.742124
25	0.029000	661.57	1.41	19.185588
30	0.025000	1,304.38	2.78	32.609400
35	0.022000	3,434.54	7.32	75.559968
40	0.021000	4,753.00	10.13	99.812916
45	0.021000	3,683.22	7.85	77.347620
50	0.022000	3,293.78	7.02	72.463248
55	0.023000	5,320.73	11.34	122.376744
60	0.026000	1,126.08	2.40	29.278080
65	0.030000	628.73	1.34	18.861840
70	0.032000	14,479.51	30.86	463.344384
75	0.034000	7,324.21	15.61	249.023208

Total		46,920.00	100.00	1,300.153200

Pollutant Name : NOX

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.670000	23.46	0.05	15.718200
10	0.517000	84.46	0.18	43.663752
15	0.408000	187.68	0.40	76.573440
20	0.343000	614.65	1.31	210.825636
25	0.311000	661.57	1.41	205.748892
30	0.286000	1,304.38	2.78	373.051536
35	0.266000	3,434.54	7.32	913.588704
40	0.252000	4,753.00	10.13	1,197.754992
45	0.244000	3,683.22	7.85	898.705680
50	0.241000	3,293.78	7.02	793.801944
55	0.244000	5,320.73	11.34	1,298.257632
60	0.253000	1,126.08	2.40	284.898240
65	0.270000	628.73	1.34	169.756560
70	0.291000	14,479.51	30.86	4,213.537992
75	0.321000	7,324.21	15.61	2,351.072052

Total		46,920.00	100.00	13,046.955252

Pollutant Name : FORMALDEHYDE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.035851	23.46	0.05	0.841064
10	0.020007	84.46	0.18	1.689711
15	0.010096	187.68	0.40	1.894817
20	0.006220	614.65	1.31	3.823135
25	0.005370	661.57	1.41	3.552642
30	0.004673	1,304.38	2.78	6.095349
35	0.004101	3,434.54	7.32	14.085065
40	0.003646	4,753.00	10.13	17.329423
45	0.003318	3,683.22	7.85	12.220924
50	0.003090	3,293.78	7.02	10.177793
55	0.002989	5,320.73	11.34	15.903656
60	0.003021	1,126.08	2.40	3.401888
65	0.003214	628.73	1.34	2.020732
70	0.003555	14,479.51	30.86	51.474665
75	0.004150	7,324.21	15.61	30.395480

Total		46,920.00	100.00	174.906344

Pollutant Name : CO2

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	1,424.748000	23.46	0.05	33,424.588080
10	1,096.734000	84.46	0.18	92,625.766704
15	869.985000	187.68	0.40	163,278.784800
20	715.355000	614.65	1.31	439,694.381460
25	623.283000	661.57	1.41	412,346.580876
30	559.753000	1,304.38	2.78	730,128.379128
35	517.484000	3,434.54	7.32	1,777,321.567296
40	492.162000	4,753.00	10.13	2,339,244.017352
45	481.490000	3,683.22	7.85	1,773,433.597800
50	484.711000	3,293.78	7.02	1,596,533.336424
55	502.456000	5,320.73	11.34	2,673,431.707968
60	536.873000	1,126.08	2.40	604,561.947840
65	592.081000	628.73	1.34	372,257.902968
70	602.651000	14,479.51	30.86	8,726,092.386312
75	618.306000	7,324.21	15.61	4,528,604.224872

Total		46,920.00	100.00	26,262,979.169880

Pollutant Name : BUTADIENE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.001116	23.46	0.05	0.026181
10	0.000707	84.46	0.18	0.059710
15	0.000454	187.68	0.40	0.085207
20	0.000328	614.65	1.31	0.201606
25	0.000271	661.57	1.41	0.179286
30	0.000234	1,304.38	2.78	0.305224
35	0.000211	3,434.54	7.32	0.724689
40	0.000198	4,753.00	10.13	0.941093
45	0.000197	3,683.22	7.85	0.725594
50	0.000206	3,293.78	7.02	0.678520
55	0.000226	5,320.73	11.34	1.202485
60	0.000263	1,126.08	2.40	0.296159
65	0.000325	628.73	1.34	0.204337
70	0.000407	14,479.51	30.86	5.893161
75	0.000541	7,324.21	15.61	3.962399

Total		46,920.00	100.00	15.485650

Pollutant Name : BENZENE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.007593	23.46	0.05	0.178132
10	0.004584	84.46	0.18	0.387146
15	0.002713	187.68	0.40	0.509176
20	0.001868	614.65	1.31	1.148170
25	0.001558	661.57	1.41	1.030729
30	0.001348	1,304.38	2.78	1.758299
35	0.001204	3,434.54	7.32	4.135191
40	0.001113	4,753.00	10.13	5.290085
45	0.001078	3,683.22	7.85	3.970511
50	0.001093	3,293.78	7.02	3.600106
55	0.001164	5,320.73	11.34	6.193327
60	0.001313	1,126.08	2.40	1.478543
65	0.001580	628.73	1.34	0.993390
70	0.001930	14,479.51	30.86	27.945458
75	0.002507	7,324.21	15.61	18.361799

Total		46,920.00	100.00	76.980063

Pollutant Name : ACROLEIN

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.000161	23.46	0.05	0.003777
10	0.000111	84.46	0.18	0.009375
15	0.000080	187.68	0.40	0.015014
20	0.000061	614.65	1.31	0.037494
25	0.000049	661.57	1.41	0.032417
30	0.000043	1,304.38	2.78	0.056088
35	0.000039	3,434.54	7.32	0.133947
40	0.000037	4,753.00	10.13	0.175861
45	0.000038	3,683.22	7.85	0.139962
50	0.000040	3,293.78	7.02	0.131751
55	0.000045	5,320.73	11.34	0.239433
60	0.000054	1,126.08	2.40	0.060808
65	0.000069	628.73	1.34	0.043382
70	0.000087	14,479.51	30.86	1.259718
75	0.000117	7,324.21	15.61	0.856933

Total		46,920.00	100.00	3.195960

Pollutant Name : ACETALDEHYDE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.017332	23.46	0.05	0.406609
10	0.009599	84.46	0.18	0.810693
15	0.004760	187.68	0.40	0.893357
20	0.002892	614.65	1.31	1.777574
25	0.002509	661.57	1.41	1.659884
30	0.002186	1,304.38	2.78	2.851366
35	0.001915	3,434.54	7.32	6.577152
40	0.001694	4,753.00	10.13	8.051575
45	0.001529	3,683.22	7.85	5.631643
50	0.001406	3,293.78	7.02	4.631060
55	0.001339	5,320.73	11.34	7.124455
60	0.001326	1,126.08	2.40	1.493182
65	0.001374	628.73	1.34	0.863872
70	0.001485	14,479.51	30.86	21.502075
75	0.001686	7,324.21	15.61	12.348621
Total		46,920.00	100.00	76.623119

Idling Emissions (grams) (Currently NOT Available)

Evaporative Running Loss Emissions (grams)

Pollutant Name : TOG_los

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.016000	920.69	883.863937

Pollutant Name : FORMALDEHYDE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000000	920.69	0.000000

Pollutant Name : BUTADIENE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000001	920.69	0.055241

Pollutant Name : BENZENE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000159	920.69	8.783398

Pollutant Name : ACROLEIN

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000000	920.69	0.000000

Pollutant Name : ACETALDEHYDE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000000	920.69	0.000000

Total Emissions

Pollutant Name	Total Emissions (grams)	Total Emissions (Kilograms)	Total Emissions (US Tons)
TOG	4,159.349137	4.159349	0.004584898
SO2	260.204244	0.260204	0.000286826
Diesel_PM	565.224145	0.565224	0.000623053
PM2.5	1,213.872012	1.213872	0.001338065
PM10	1,300.153200	1.300153	0.001433174
NOX	13,046.955252	13.046955	0.014381806
FORMALDEHYDE	174.906344	0.174906	0.000192801
CO2	26,262,979.169880	26,262.979170	28.949978998
BUTADIENE	15.540892	0.015541	0.000017131
BENZENE	85.763461	0.085763	0.000094538
ACROLEIN	3.195960	0.003196	0.000003523
ACETALDEHYDE	76.623119	0.076623	0.000084463

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Appendix C MSATS - Information that is Unavailable or Incomplete

Evaluating the environmental and health impacts from MSATs on a proposed highway project would involve several key elements, including emissions modeling, dispersion modeling in order to estimate ambient concentrations resulting from the estimated emissions, exposure modeling in order to estimate human exposure to the estimated concentrations, and then final determination of health impacts based on the estimated exposure. Each of these steps is encumbered by technical shortcomings or uncertain science that prevents a more complete determination of the MSAT health impacts of this project.

1. **Emissions:** The EPA tools to estimate MSAT emissions from motor vehicles are not sensitive to key variables determining emissions of MSATs in the context of highway projects. While MOBILE 6.2 is used to predict emissions at a regional level, it has limited applicability at the project level. MOBILE 6.2 is a trip-based model--emission factors are projected based on a typical trip of 7.5 miles, and on average speeds for this typical trip. This means that MOBILE 6.2 does not have the ability to predict emission factors for a specific vehicle operating condition at a specific location at a specific time. Because of this limitation, MOBILE 6.2 can only approximate the operating speeds and levels of congestion likely to be present on the largest-scale projects, and cannot adequately capture emissions effects of smaller projects. For particulate matter, the model results are not sensitive to average trip speed, although the other MSAT emission rates do change with changes in trip speed. Also, the emissions rates used in MOBILE 6.2 for both particulate matter and MSATs are based on a limited number of tests of mostly older-technology vehicles. Lastly, in its discussions of PM under the conformity rule, EPA has identified problems with MOBILE6.2 as an obstacle to quantitative analysis.

   These deficiencies compromise the capability of MOBILE 6.2 to estimate MSAT emissions. MOBILE6.2 is an adequate tool for projecting emissions trends, and performing relative analyses between alternatives for very large projects, but it is not sensitive enough to capture the effects of travel changes tied to smaller projects or to predict emissions near specific roadside locations.

2. **Dispersion:** The tools to predict how MSATs disperse are also limited. The EPA's current regulatory models, CALINE3 and CAL3QHC, were developed and validated more than a decade ago for the purpose of predicting episodic concentrations of carbon monoxide to determine compliance with the NAAQS. The performance of dispersion models is more accurate for predicting maximum concentrations that can occur at some time at some location within a geographic area. This limitation makes it difficult to predict accurate exposure patterns at specific times at specific highway project locations across an urban area to assess potential health risk. The NCHRP is conducting research on best practices in applying models and other technical methods in the analysis of MSATs. This work also will focus on identifying appropriate methods of documenting and communicating MSAT impacts in the NEPA process and to the general public. Along with these general limitations of dispersion models, FHWA is also faced with a lack of monitoring data in most areas for use in establishing project-specific MSAT background concentrations.

3. **<u>Exposure Levels and Health Effects</u>:** Finally, even if emission levels and concentrations of MSATs could be accurately predicted, shortcomings in current techniques for exposure assessment and risk analysis preclude us from reaching meaningful conclusions about project-specific health impacts. Exposure assessments are difficult because it is difficult to accurately calculate annual concentrations of MSATs near roadways, and to determine the portion of a year that people are actually exposed to those concentrations at a specific location. These difficulties are magnified for 70-year cancer assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over a 70-year period. There are also considerable uncertainties associated with the existing estimates of toxicity of the various MSATs, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population. Because of these shortcomings, any calculated difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with calculating the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against other project impacts that are better suited for quantitative analysis.